Vol. 898 Number 1

OFFICIAL GAZETTE

of the UNITED STATES PATENT OFFICE

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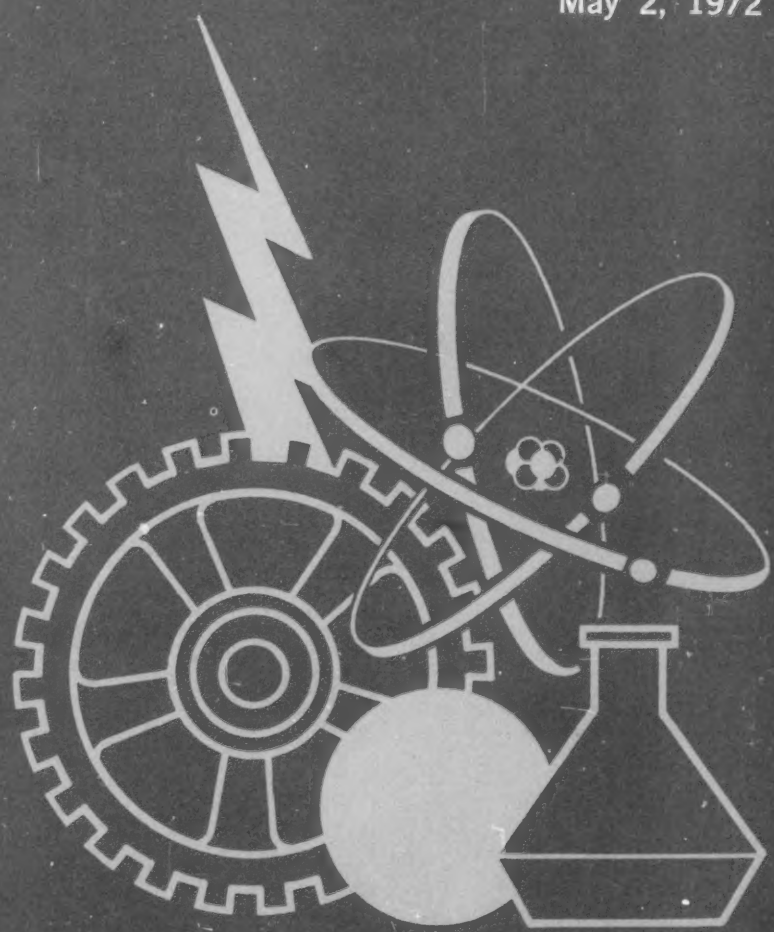
PATENTS

May 2, 1972



U. S. DEPARTMENT OF COMMERCE

Patent Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

May 2, 1972 Volume 898 Number 1

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PATENT OFFICE NOTICES

Board of Appeals Decisions Rendered in the Month of March 1972

Examiner affirmed	156
Examiner affirmed in part	15
Examiner reversed	33
Total	204

Registration to Practice

The following list contains the names of applicants for registration to practice before the United States Patent Office who attained passing grades in the examination of September 7, 1971, or persons applying for registration under Rule 341(e) of the "Rules of Practice of the United States Patent Office in Patent Cases."

Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds should be furnished the Commissioner of Patents on or before May 26, 1972.

Fincham, Ian, 145 Madsen Ave., Beaconsfield, Quebec, Canada
James, William H., 41 Linden Road, Bale d'Urfe, Quebec, Canada
Ram, Michael J., 15 Cleveland Terrace, West Orange, N.J. 07052
Van Brunt, William A., 16 Argyle St., Andover, Mass. 01810

LUTRELLE F. PARKER,
Apr. 4, 1972. *Chairman, Committee on Enrollment.*

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,594,256, C. E. Compton, MINING MACHINE HEAD; **2,760,255,** Same, SCREW CONVEYOR AND MANUFACTURE THEREOF; **2,760,624,** same; **2,784,955,** same, ROTARY MINING MACHINE CUTTER HEAD WITH REAR HELICALLY EXTENDING TRANSVERSE OPENING; **2,719,708,** same, PAN GUIDEWAY FOR ROTARY MINING HEAD, **filed** Nov. 2, 1970, U.S. Ct. of App., 4th Cir., Virginia (Richmond), Doc. 15,248, *Meta Products, Inc.* v. *Charles E. Compton, Joy Manufacturing Company and Polan Industries, Inc.* The District Court's decision to enforce the plantiffs' rights under the said patents is reversed. Plaintiffs are entitled to no accounting for past damages. The District Court will withhold its injunction until misuse has abated consistent with the opinion of this court, Dec. 16, 1971.

2,719,708. (See 2,594,256.)

2,756,630, E. W. Goldberg, AUTOMATIC SLIDE CHANGER; **3,249,001,** N. L. Stauffer, AUTOMATIC FOCUSING PHOTOGRAPHIC PROJECTOR, **filed** June 21, 1969, D.C., N.D. Ill. (Chicago), Doc. 68c1159, *Honeywell Inc.* v. *GAF Corp. et al.* Case dismissed pursuant to stipulation, Oct. 27, 1971.

2,760,255. (See 2,594,256.)

2,760,624. (See 2,594,256.)

2,784,955. (See 2,594,256.)

3,015,517, A. K. Thornburgh, AIR CURRENT DEFLECTOR SHIELD, **filed** Nov. 16, 1971, D.C. Colo. (Denver), Doc. C–3543. *Deflecta-Shield Corp.* v. *Autotron Products, Inc.*

3,126,692, Weygandt and Weygandt, MACHINE FOR HARVESTING BERRIES AND SIMILAR PRODUCT FROM THEIR PLANTS; **3,380,236,** E. S. Shepardson, APPARATUS FOR HARVESTING GRAPES; **3,439,478,** J. R. Orton, METHOD OF HARVESTING GRAPES OR THE LIKE; **3,439,482,** same, GRAPE HARVESTING MACHINE; **3,545,183,** E. S. Shepardson, METHOD FOR HARVESTING GRAPES, **filed** Sept. 20, 1971, D.C., N.D. Calif. (San Francisco), Doc. C71–1818LHB, *Chisholm-Ryder Company, Inc., New York State Grape Production Research Fund, Inc., and Raymond M. Weygandt* v. *Up-Right Inc. and Wallace J. S. Johnson.*

3,130,637, K. E. Golden, SLIDE PROJECTOR; **3,209,647,** W. J. Hall, SLIDE PROJECTOR USING A BOX OR CIRCULAR SLIDE MAGAZINE; **3,263,558,** K. E. Golden, FOCUSING MEANS FOR A SLIDE PROJECTOR; **D. 199,420,** R. W. Lanigan, SLIDE PROJECTOR; **D. 202,141,** W. J. Hall, ROTARY SLIDE TRAY, **filed** Dec. 4, 1968, D.C., N.D. Ill. (Chicago), Doc. 68c2345, *GAF Corporation* v. *Berkey Photo, Inc., and Atlas Rand Corp.* Stipulation and order of dismissal as to defendants Berkey Photo, Inc. and Atlas Rand Corp., Sept. 20, 1971.

3,141,172, J. B. Hirschmann, VENTILATED GOGGLES, **filed** Nov. 5, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c2659, *H. L. Bouton Company, Inc.* v. *Thermacote Company.*

3,157,037, Nebel and Nebel, RUN RESISTANT KNITTED STOCKINGS; **3,430,463,** same, METHOD AND APPARATUS FOR MAKING RUN-RESISTANT KNITTED FABRIC, **filed** Sept. 1, 1971, D.C., S.D. Fla. (Miami), Doc. 71–1379–C–CA, *Hanes Corp.* v. *London-Aire, Inc.* Judgment, plaintiff owner of said patents, which are valid; defendants have infringed and are enjoined, Dec. 20, 1971.

3,179,026, A. F. Crone, SEALING ELEMENT FOR PAVEMENT GROOVES, **filed** Apr. 29, 1966, D.C., N.D. Ohio (Cleveland), Doc. C–66–89, *Acme Highway Products Corporation* v. *The D. S. Brown Company and Delmont D. Brown.* Judgment, the judgment of the District Court in this cause is reversed and this case is remanded for proceedings consistent with the opinion, Mar. 16, 1971.

3,209,647. (See 3,130,637.)

3,220,857. (See 3,407,080.)

3,249,001. (See 2,756,630.)

3,263,558. (See 3,130,637.)

3,313,545, J. R. Bartsch, UNITARY MOLDED GOLF BALL; **3,438,933,** same, MOLDING PROCESS AND COMPOSITION, **filed** Oct. 6, 1971, D.C., E.D.N.Y. (Brooklyn), Doc. 71–C–1319, *PGR Golf Ball Company, Inc.* v. *Chemold Corporation.*

3,328,141. (See 3,429,080.)

3,359,116, L. L. Little, PROCESS OF MAKING SOUR CREAM TYPE PRODUCTS AND CREAM CHEESE; **3,378,375,** same, METHOD OF PREPARING ACIDIFIED DAIRY PRODUCTS, **filed** Sept. 21, 1971, D.C., S.D. Ohio (Dayton), Doc. 4127, *The Battelle Development Corp.* v. *Molers Belmont Dairy Co.*

3,368,932, Weill, Woods and Solomon, APPARATUS FOR LAMINATING TWO FABRICS TO FOAM IN ONE SINGLE OPERATION, **filed** Jan. 6, 1969, D.C., E.D.N.Y. (Brooklyn), Doc. 69C8, *Flame Laminating Machines Corp.* v. *Ideal Foam Corp.* Order of dismissal, Nov. 9, 1971.

3,378,375. (See 3,359,116.)

3,380,236. (See 3,126,692.)

3,407,080, Rainwater, Beck and Parks, LOW DENSITY DRIED AGGLOMERATED FOODS INCLUDING POTATOES AND PROCESS FOR THEIR PRODUCTION; **3,220,857,** Hollis and Borders, PROCESS FOR PREPARING DEHYDRATED POTATOES, **filed** June 1, 1971, D.C. Del. (Wilmington), Doc. 4138, *American Potato Co.* v. *General Foods Corporation.* Stipulation of dismissal with prejudice as to any and all claims and counterclaims, Oct. 20, 1971.

3,429,080, R. L. Lachapelle, COMPOSITION FOR POLISHING CRYSTALLINE SILICON AND GERMANIUM AND PROCESS; **3,328,141,** same, PROCESS FOR POLISHING CRYSTALLINE SILICON, **filed** Aug. 6, 1970, D.C.N.J. (Trenton), Doc. C–1050–70, *Tizon Chemical Corporation* v. *Process Research Products.* Consent judgment for permanent injunction, Nov. 10, 1971.

3,430,463. (See 3,157,037.)

3,438,933. (See 3,313,545.)

3,439,478. (See 3,136,692.)

3,439,482. (See 3,126,692.)

3,498,215, L. D. Brinkman, LAMINATING DEVICE; **3,513,521,** A. L. Fritz, APPARATUS FOR ASSEMBLING AND SECURING T-EDGING, **filed** Oct. 5, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–2402–FW, *Royal Industries, Inc.* v. *California Woodworking Machinery Co.*

3,513,521. (See 3,498,215.)

3,545,183. (See 3,126,692.)

Re. 24,730, C. E. Reeves, PORTABLE SIGNALLING DEVICE, **filed** Dec. 28, 1970, D.C.N.J. (Newark), Doc. 1732–70, *Falcon Safety Products, Inc.* v. *Wagner Electric Sales Corp.* Stipulation and order of dismissal, Nov. 29, 1970.

Re. 24,954, H. Church, APPARATUS FOR FILTERING SOLIDS FROM GAS-SOLIDS SUSPENSIONS, **filed** Jan. 18, 1963, D.C., M.D. Pa. (Scranton), Doc. 7980–C, *The Slick Corporation* v. *Young Machinery Co., Inc.* By stipulation of counsel, case dismissed without prejudice, including all counterclaims, Dec. 21, 1967.

D. 199,420. (See 3,130,637.)

D. 202,141. (See 3,130,637.)

D. 221,219, T. Winrow, SOFA, **filed** Nov. 12, 1971, D.C., M.D. Fla. (Jacksonville), Doc. 71–914–C–J, *Futorian Corporation* v. *Madison House, Inc.* **Same, filed** Aug. 20, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c2049, *Futorian Corporation* v. *David Fitchmun & Associates, Inc.* Patent valid and defendants permanently enjoined, Oct. 15, 1971.

Certificates of Correction for the Week of May 2, 1972

Re. 27,240	3,594,124	3,614,302	3,619,453
D. 220,992	3,595,515	3,614,399	3,619,461
D. 221,931	3,595,544	3,614,400	3,619,530
3,338,469	3,596,373	3,614,569	3,619,553
3,354,657	3,596,647	3,614,623	3,619,575
3,383,174	3,597,043	3,614,627	3,619,665
3,386,979	3,597,061	3,614,912	3,619,674
3,405,742	3,597,675	3,615,056	3,619,677
3,426,134	3,597,713	3,615,198	3,619,769
3,429,735	3,600,677	3,615,259	3,619,959
3,487,023	3,601,539	3,615,260	3,619,995
3,493,182	3,601,810	3,615,350	3,621,970
3,493,968	3,604,105	3,615,400	3,622,049
3,514,234	3,604,259	3,615,413	3,622,237
3,516,007	3,604,389	3,615,442	3,622,320
3,518,200	3,604,654	3,615,538	3,622,355
3,519,897	3,604,665	3,615,580	3,622,368
3,532,234	3,604,891	3,615,750	3,622,391
3,534,264	3,604,931	3,615,766	3,622,757
3,534,272	3,605,820	3,615,791	3,622,889
3,536,153	3,606,074	3,615,826	3,622,899
3,542,580	3,606,720	3,616,130	3,623,490
3,542,611	3,606,838	3,616,172	3,623,664
3,551,027	3,607,277	3,616,208	3,623,867
3,551,384	3,607,424	3,616,349	3,623,961
3,553,459	3,607,792	3,616,350	3,624,061
3,561,516	3,608,031	3,616,426	3,624,071.
3,566,999	3,608,486	3,616,446	3,624,143
3,571,733	3,608,627	3,616,493	3,624,229
3,572,786	3,608,682	3,616,581	3,624,489
3,572,789	3,608,750	3,616,666	3,624,731
3,572,860	3,608,894	3,616,711	3,625,611
3,574,181	3,609,177	3,616,967	3,625,648
3,574,481	3,609,187	3,617,127	3,625,731
3,574,858	3,609,222	3,617,145	3,625,862
3,576,404	3,609,370	3,617,152	3,625,870
3,577,395	3,609,560	3,617,300	3,625,901
3,577,396	3,609,652	3,617,302	3,626,021
3,579,013	3,609,938	3,617,317	3,626,219
3,579,320	3,610,273	3,617,338	3,626,452
3,580,884	3,610,410	3,617,364	3,626,947
3,581,272	3,610,425	3,617,467	3,627,199
3,582,343	3,610,530	3,617,588	3,627,356
3,582,810	3,610,772	3,617,653	3,627,568
3,583,540	3,610,799	3,617,741	3,628,294
3,585,767	3,610,950	3,617,805	3,628,303
3,586,100	3,611,007	3,617,851	3,628,400
3,586,340	3,611,126	3,617,973	3,629,179
3,586,474	3,611,144	3,618,079	3,629,207
3,586,545	3,611,305	3,618,085	3,629,669
3,586,841	3,611,572	3,618,121	3,630,495
3,586,929	3,611,745	3,618,349	3,630,587
3,587,059	3,611,778	3,618,365	3,631,072
3,587,176	3,611,890	3,618,520	3,631,532
3,588,226	3,612,025	3,618,604	3,631,566
3,588,291	3,612,545	3,618,615	3,632,101
3,588,933	3,612,638	3,618,667	3,632,135
3,589,002	3,612,644	3,618,684	3,632,402
3,589,034	3,612,691	3,618,895	3,632,621
3,589,430	3,612,745	3,618,978	3,632,821
3,589,711	3,613,485	3,619,091	3,633,153
3,590,234	3,613,566	3,619,162	3,633,156
3,591,507	3,613,613	3,619,171	3,636,709
3,592,270	3,613,715	3,619,320	3,637,571
3,593,973	3,613,863	3,619,409	

Patents Available for Licensing or Sale

2,995,619. SYSTEM OF TELEVISION TRANSMISSION AND PHOTOGRAPHIC REPRODUCTION OF THE TELEVISED IMAGE. Samuel Freeman, 13 Birchwood Court, E., Syosset, N.Y., 11791.

3,321,943. KEY SAFE. Robert Reyes, 614 Forest Ave., Los Angeles, Calif., 90033.

3,140,437. VOLTAGE REGULATING SYSTEM FOR ALTERNATING CURRENT GENERATORS UTILIZING HALF WAVE SELF-SATURATING CORE REACTORS. Edward Bretch. Correspondence to: Miss Helen M. Bretch, 7208 Zephyr, Maplewood, Mo., 63143.

3,224,879. PROCESS FOR PRODUCING A COFFEE EXTRACT. Mrs. Elanor DiNardo, Rte. A–2, Box 186, Dunnellon, Fla., 32630.

3,225,761. FATIGUE SUPPORT. Robert Swensen, 120 Poincianna Drive, Martinez, Ga., 30907.

3,522,869. COIN OPERATED HAIR DRYING APPARATUS. Julia Schmidt, 1301 NE 26th Ave., Pompano Beach, Fla., 33062.

3,525,099. HAND GUIDED WALK-BEHIND SELF-PROPELLED MATERIAL CONVEYING CART. John Fuhrmann. Correspondence to: Robert C. Weber, 1022 Ellicott Square, Buffalo, N.Y., 14203.

3,618,598. LEG TRACTION ANKLE STRAP. Ronald H. Davis, 1922 Somerset Ave., Cardiff by the Sea, Calif., 92007.

3,625,664. PROCESS FOR THE PRODUCTION OF RICH FUEL TO REPLACE NATURAL GAS BY MEANS OF CATALYTIC HYDROGASIFICATION UNDER PRESSURE OF FLUID HYDROCARBONS. Carlo Padovani. Correspondence to: Murphy & Dobyns, 2001 Jefferson Davis Highway, Suite 307, Arlington, Va., 22202.

3,633,040. REMOTE CONTROL VEHICLE-STARTING SYSTEM USING A LOW AC VOLTAGE SUPPLY. Gordon H. Baxter, P.O. Box 186, Circleville, N.Y., 10919.

3,633,246. CYLINDER COVER FASTENING DEVICES. Alan D. Kirkpatrick. Inquiries concerning the patent should be sent to: DICAR, Inc., 111 Clinton Road, Fairfield, N.J., 07006.

3,635,096. RELEASE MECHANISM. Edward C. Caufield, 9685 S. 2585 East, Sandy, Utah., 84070.

3,635,291. FLOATING CARRIER. Jerry J. Tomanek, Star Route, Tuscott, Tex., 79260.

3,639,358. METHOD OF PREPARING AROMATIC POLYAMIDES. Gus Nichols, 15–C Heisz St., Edwardsville, Pa., 18704.

3,640,015. HUMANE ANIMAL TRAP. A. M. Fisher, Slave Lake, Alberta, Canada.

3,641,582. RING MONITOR. George C. Thesdoridis, Colonnade Club, University of Virginia, Charlottesville, Va., 22903.

3,642,285. BOARD GAME APPARATUS. Frank A. Impastato, 1240 Papworth Ave., Metairie, La., 70005.

3,643,202. QUICK RELEASE FEMALE PLUG. James A. Coon, 929 Drever St., West Sacramento, Calif., 95691.

3,648,824. IDLER ROLLER DEVICE FOR TROUGHED CONVEYOR BELTS. Charles D. Speck. Correspondence to: Sim & McBurney, Suite 701, 330 University Ave., Toronto 1, Canada.

3,649,965. NECKTIE. Alfred Krivda, P.O. Box 1055, Oroville, Calif., 95965.

3,654,633. NECKTIE KNOT-HOLDING DEVICE. Herberts K. Goba. Correspondence to: Stevens, Davis, Miller & Mosher, 1911 Jefferson Davis Highway, Suite 600, Crystal Mall 1, Arlington, Va., 22202.

Colgate-Palmolive Company is prepared to grant non-exclusive sublicenses upon reasonable terms and conditions under the following patent.

Applications for sub-licenses should be addressed to: Patent Counsel, Colgate-Palmolive Company, 300 Park Ave., New York, N.Y., 10022.

Re. 24,642. THERAPEUTIC PREPARATION OF IRON.

General Electric Company is prepared to grant non-exclusive licenses under the following 29 patents upon reasonable terms to domestic manufacturers.

Applications for license under the following patent may be addressed to: Division Patent Counsel, Switchgear Equipment Business Div., General Electric Company, 6901 Elmwood Ave., Philadelphia, Pa., 19142.

3,624,324. CIRCUIT BREAKER ACTUATED BY EXTRA-HIGH SPEED ELECTROHYDRAULICALLY OPERATED PISTON.

Applications for license under the following patent may be addressed to: Patent Counsel, Mobile Radio Products Department, General Electric Company, Lynchburg, Va., 24502.

3,624,513. IMAGE FREQUENCY SUPPRESSION CIRCUIT.

Applications for license under the following patent may be addressed to: Division Patent Counsel, Switchgear Equipment Business Div., General Electric Company, 6901 Elmwood Ave., Philadelphia, Pa., 19142.

3,631,367. CONICAL LAYER TYPE RADIAL DISK WINDING WITH INTERWOUND ELECTROSTATIC SHIELD.

Applications for license under the following patent may be addressed to: Patent Counsel, Data Communication Products Department, General Electric Company, Waynesboro, Va., 22980.

3,643,185. MERCURY-WETTED RELAY AND METHOD OF MANUFACTURE.

Applications for license under the following 25 patents may be addressed to: General Electric Company, Aircraft Engine Group, 1000 Western Ave., Lynn, Mass., 01910, Attn: Patent Counsel.

3,114,829. ARC WELDING METHOD AND APPARATUS.

3,147,539. METHOD AND APPARATUS FOR PRODUCING BLADES.
3,155,491. BRAZING ALLOY.
3,155,499. BRAZING ALLOY.
3,155,501. NICKEL BASE ALLOY.
3,226,967. APPARATUS FOR PRODUCING BLADES.
3,288,265. BORING AND FACING TOOL.
3,229,494. APPARATUS FOR PRODUCING BLADES.
3,230,160. ELECTROLYTE FOR ELECTROCHEMICAL REMOVAL OF MATERIAL.
3,235,415. HEAT TREATMENT AND ALLOY.
3,244,603. ELECTRODEPOSITION OF A NICKEL-MANGANESE ALLOY.
3,278,881. MEMBRANE STRAIN GAUGE.
3,590,670. MACHINE TOOL CUTTING INDICATION AND CONTROL.
3,350,534. ELECTRODE HOLDER.
3,391,269. ELECTRODE HOLDER AND LOADER.
3,403,021. COBALT BASE ALLOY.
3,403,059. NICKEL BASE ALLOY.
3,409,522. ELECTROCHEMICAL MACHINING OF TITANIUM AND ALLOYS THEREFOR.
3,415,641. WROUGHT NICKEL BASE ALLOY.
3,467,516. WROUGHT NICKEL BASE ALLOY.
3,576,681. WROUGHT NICKEL BASE ALLOY ARTICLE.
3,619,077. HIGH TEMPERATURE AIRFOIL.
3,631,735. GAS TURBINE ENGINE GEAR BOXES.
3,632,224. ADJUSTABLE BLADE TURBINE.
3,632,228. DEVICE FOR LOCKING TURBOMACHINERY BLADES.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the following 35 patents.

Inquiries respecting licenses should be addressed to: RCA Corporation, Staff Vice President, Domestic Licensing, 1133 Avenue of Americas, New York, N.Y., 10036.

3,638,881. BRAKE APPARATUS.
3,639,787. INTEGRATED BUFFER CIRCUITS FOR COUPLING LOW-OUTPUT IMPEDANCE DRIVER TO HIGH-INPUT IMPEDANCE LOAD.
3,639,804. ION DISCHARGE TUBE EMPLOYING CATAPHORETIC TECHNIQUES.
3,639,908. SOLID-STATE ANALOG CROSS-POINT MATRIX HAVING BILATERAL CROSSPOINTS.
3,640,765. SELECTIVE DEPOSITION OF METAL.
3,640,767. ENCAPSULATED MAGNETIC MEMORY ELEMENT.
3,640,792. APPARATUS FOR CHEMICALLY ETCHING SURFACES.
3,640,811. METHOD OF METALIZING SEMICONDUCTOR DEVICES.
3,640,812. METHOD OF MAKING ELECTRICAL CONTACTS ON THE SURFACE OF A SEMICONDUCTOR DEVICE.
3,640,853. ADHESION OF NONCONDUCTING AND CONDUCTING MATERIALS.
3,641,255. NON-INTERACTING LENS SYSTEM FOR A COLOR ENCODING CAMERA.
3,641,258. SAMPLE-AND-HOLD CIRCUIT.
3,641,361. PROTECTION CIRCUIT.
3,641,362. LOGIC GATE.
3,641,368. LOGIC CIRCUIT WHICH TURNS ON AND OFF RAPIDLY.
3,641,398. HIGH FREQUENCY SEMICONDUCTOR DEVICE.
3,641,432. RADIO POSTAL SYSTEM ACKNOWLEDGEMENT APPARATUS.
3,641,448. TRANSISTOR SIGNAL TRANSLATING STAGE.
3,641,461. TEMPERATURE COMPENSATED CRYSTAL OSCILLATOR.
3,641,474. SEMICONDUCTOR MOUNTING STRUCTURE.
3,643,019. VARIABLE LENGTH CODING METHOD AND APPARATUS.
3,643,156. PULSE-TYPE CIRCUIT ELEMENT-TESTING METHOD.
3,643,192. TOROIDAL ELECTROMAGNETIC DEFLECTION YOKE.
3,643,216. HOLOGRAPHIC IDENTIFICATION SYSTEM.
3,643,220. SYNCHRONIZATION OF SERIAL MEMORY.
3,643,299. ELECTRON BEAM TUBE AND METHOD OF ADJUSTING THE ELECTRODE SPACING OF AN ELECTRON GUN THEREIN.
3,644,802. RATIO-COMPENSATED RESISTORS FOR INTEGRATED CIRCUIT.
3,644,838. AMPLIFIER USING BIPOLAR AND FIELD-EFFECT TRANSISTORS.
3,644,839. TRANSFERRED ELECTRON AMPLIFIER.
3,645,634. APPARATUS FOR MEASURING LIGHT TRANSMISSION OF A SEMITRANSPARENT MEMBRANE.
3,646,260. ELECTRONIC EDITING APPARATUS.
3,646,362. SAMPLE-AND-HOLD CIRCUIT.
3,646,390. IMAGE STORAGE SYSTEM.
3,646,486. GYROMAGNETIC ISOLATOR WHEREIN EVEN MODE COMPONENTS ARE CONVERTED TO ODD MODE COMPONENTS BY BIASED FERRITE.
3,646,568. BEAM CONTROL SYSTEM.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MARCH 21, 1972

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-11-71
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-04-70
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	1-25-71
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	2-01-71
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-01-70
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	7-21-71
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	2-11-71
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	3-03-71
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	4-01-71
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	1-06-71
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	1-06-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	2-03-71
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	1-08-71
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	1-04-71
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	3-17-71
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	2-03-71

Expiration of patents: The patents within the range of numbers indicated below expire during April 1972, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,705,322 to 2,707,276, inclusive
Plant Patents..... Numbers 1,374 to 1,388, inclusive

PLANT PATENTS

GRANTED MAY 2, 1972

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,143
AZALEA PLANT
Henry W. Motzkau, Whitewater, Wis., assignor to Yoder Brothers, Inc., Barberton, Ohio
Filed Aug. 26, 1970, Ser. No. 67,299
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—57 **1 Claim**

1. A new and distinct variety of azalea characterized particularly as to novelty by its rapid yet compact growth habit, its rose color, its long-lasting flowers, its non-shattering, its evergreen type foliage, its early-mid season profuse flowering, and its adaptability to year round flowering programs.

3,144
ROSE PLANT
William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.
Filed Sept. 9, 1970, Ser. No. 70,943
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—28 **1 Claim**

1. A new and distinct variety of rose plant of the floribunda class substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a vigorous, angularly branched habit of growth, an ovoid, pointed bud of maroon color, a uniformly imbricated flower form, the color of the open flower is Currant Red on the upper side of the petals and Cardinal Red on the reverse side, and an unusually pronounced resistance to powdery mildew, wherever this variety has been observed, is also a distinguishing characteristic.

3,145
NECTARINE TREE
John H. Enns, 39572 Road 64, Dinuba, Calif. 93618
Filed Sept. 10, 1970, Ser. No. 71,282
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—41 **1 Claim**

A large, vigorous, spreading, vase-formed, open nectarine tree which is hardy and a regular and productive bearer of large, uniform, early ripening fruit having yellow skin substantially overspread with red, and yellow flesh with red near the stone; the latter being semifree.

3,146
AFRICAN VIOLET
Hermann Holtkamp, Werther Strasse 5–7, Postfach 19, 4243 Isselburg, Germany
Original application Oct. 7, 1968, Ser. No. 765,700, now Patent No. 3,053. Divided and this application Sept. 14, 1970, Ser. No. 72,245
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—69 **1 Claim**

A hybrid violet of a descendant of a cross between the *Saintpaulia ionantha* and *Saintpaulia shumensis* species which has permanent new characteristics including strength of stem, fast and vigorous growth, profuse flowering, uniform bouquet, prolonged blooming period, resistance to disease, reliability in initiating new plantlets, retention of flowers past maturity on their respective stems, reliability in new plants retaining characteristics of the parent and pronounced uniformity throughout the life cycle.

3,147
AFRICAN VIOLET
Hermann Holtkamp, Werther Strasse 5–7, Postfach 19, 4243 Isselburg, Germany
Original application Oct. 7, 1968, Ser. No. 765,700, now Patent No. 3,053. Divided and this application Sept. 14, 1970, Ser. No. 72,246
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—69 **1 Claim**

A hybrid violet of a descendant of a cross between the *Saintpaulia inonantha* and *Saintpaulia shumensis* species which has permanent new characteristics including strength of stem, fast and vigorous growth, profuse flowering, uniform bouquet, prolonged blooming period, resistance to disease, reliability in initiating new plantlets, retention of flowers past maturity on their respective stems, reliability in new plants retaining characteristics of the parent and pronounced uniformity throughout the life cycle.

3,148
AFRICAN VIOLET
Hermann Holtkamp, Werther Strasse 5–7, Postfach 19, 4243 Isselburg, Germany
Original application Oct. 7, 1968, Ser. No. 765,700, now Patent No. 3,053. Divided and this application Sept. 14, 1970, Ser. No. 72,247
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—69 **1 Claim**

A hybrid violet of a descendant of a cross between the *Saintpaulia ionantha* and *Saintpaulia shumensis* species which has permanent new characteristics including strength of stem, fast and vigorous growth, profuse flowering, uniform bouquet, prolonged blooming period, resistance to disease, reliability in initiating new plantlets, retention of flowers past maturity on their respective stems, reliability in new plants retaining characteristics of the parent and pronounced uniformity throughout the life cycle.

3,149
KALANCHOE PLANT
James T. Irwin, Canyon, Tex., assignor to Irwin Greenhouses, Inc., Canyon, Tex.
Filed Sept. 15, 1970, Ser. No. 72,557
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of kalanchoe plant, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a highly branched, but sturdy and upright plant habit, a consistent plant height ranging between about 12 inches and 15 inches tall, medium sized foliage of an attractive Moss Green to Fern Green color, a profuse blooming habit, a substantially uniform blooming date, but with an ability to respond to short day treatment making it capable of year-round blooming, an unusual, attractive and distinctive soft orange flower color, long-lasting qualities as a potted plant, and an ability to initiate and develop flower buds under high night temperatures of summer when other varieties fail.

3,150

NEW AND DISTINCT VARIETY OF BLUEGRASS PLANT

Gerard William Pepin, North Brunswick, and Cyril Reed Funk, Jr., Milltown, N.J., assignors to Rutgers University, New Brunswick, N.J.

Filed Sept. 17, 1970, Ser. No. 73,270
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—88 **1 Claim**

A Kentucky bluegrass plant which exhibits excellent seed producing properties and a rich dark green color. The turf is quite leafy and of high quality, with good density and vigor. The plant has good resistance to common grass diseases, particularly stripe smut, leaf spot and leaf rust.

3,151

NEW AND DISTINCT VARIETY OF BLUEGRASS PLANT

Cyril Reed Funk, Jr., Milltown, N.J., assignor to Rutgers University, New Brunswick, N.J.

Filed Sept. 17, 1970, Ser. No. 73,271
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—88 **1 Claim**

A Kentucky bluegrass plant which exhibits a rich, dark green color, a moderately fine leaf texture, good rhizome and tiller development, a short ligule without hair, and moderately small panicles and spikelets, with three florets per spikelet. The plant has very good turf density and horizontal spreading ability and is highly resistant to common grass diseases, particularly stripe smut, powdery mildew, and leaf rust.

3,152

NEW AND DISTINCT VARIETY OF BLUEGRASS PLANT

Gerard William Pepin, North Brunswick, and Cyril Reed Funk, Jr., Milltown, N.J., assignors to Rutgers University, New Brunswick, N.J.

Filed Sept. 17, 1970, Ser. No. 73,272
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—88 **1 Claim**

A Kentucky bluegrass plant having a wide plant spread and a dark, bluish-green color which is maintained from early spring to late fall. The plant is aggressive, highly apomictic and exhibits good resistance to stripe smut disease.

PATENTS

GRANTED MAY 2, 1972

GENERAL AND MECHANICAL

3,659,294

ADJUSTABLE LINK FOR PROSTHETIC LIMB

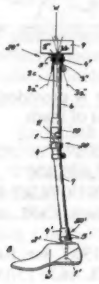
Richard Glabiszewski, Duderstadt/Han, Germany, assignor to Otto Bock, Orthopadische Industrie KG, Industriestrasse, Duderstadt, Germany

Filed May 1, 1970, Ser. No. 33,793

Claims priority, application Germany, May 3, 1969, P 19 22 619.8

Int. Cl. A61f *1/08*

U.S. Cl. 3—21 **4 Claims**



A link between members of a prosthetic limb, such as a connector between a knee joint and an artificial shank, has a frustopyramidal four-sided boss divergingly projecting from a spherically convex base which slidably engages a correspondingly concave annular socket surrounding the boss. Two pairs of setscrews, lodged 90° apart in the annular socket, bear upon the sides of the frustopyramidal boss to enable its adjustment, within a limited swing angle, in two mutually orthogonal planes.

3,659,295

SWIMMING POOL

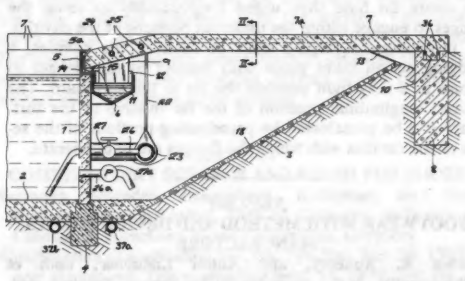
Josef Linecker, Rosengasse 5, A5230 Mattighofen, Austria

Filed Jan. 20, 1970, Ser. No. 4,290

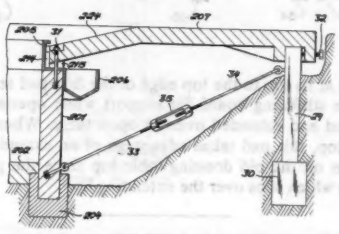
Claims priority, application Austria, Jan. 21, 1969, A 631/69; Mar. 25, 1969, A 2940/69

Int. Cl. E04h *3/16, 3/18*

U.S. Cl. 4—172.19 **8 Claims**



A swimming pool is constructed from a tank having sidewalls supported against the outwardly acting water pressure only by engagement along their upper edges with a surrounding platform braced along its outer circumference against a peripheral sill or set of posts sunk into the soil at a distance from the basin. The space between the sidewalls of the basin and the peripheral support means is largely empty



and accommodates water supply ducts as well as troughs to catch the overflow spilling across the platform; when provided with a fluidtight bottom lining, this space can also serve for the temporary storage of excess pool water.

3,659,296

TOILET SEAT

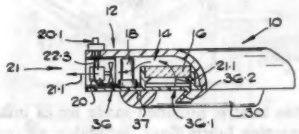
Robin Harry Stamper, 1891 Westbourne Rd., Bryanston, Transvaal Province, Republic of South Africa

Filed June 16, 1970, Ser. No. 46,655

Claims priority, application South Africa, June 24, 1969, 69/4489

Int. Cl. A47k *13/30*

U.S. Cl. 4—217 **8 Claims**



A toilet seat embodying a fan and a deodorizing element. The toilet seat has a cavity to accommodate the fan and the deodorizing element. Conveniently the fan and the said element are mounted on a cover member adapted to seat over the cavity. The toilet seat further includes a seal on its underside to enable the seat to seat sealingly on the rim of a toilet bowl.

3,659,297

BABY DRESSING TABLE PAD REPLACEMENT

Bernard Schutz, 40 East 78th St., New York, N.Y.

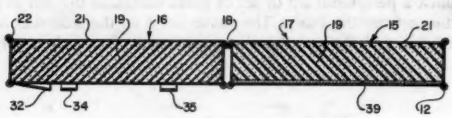
Filed July 22, 1970, Ser. No. 57,042

Int. Cl. A47c *27/00, 7/00*

U.S. Cl. 5—357 **5 Claims**

A baby dressing table pad replacement that can universally replace the original pad of a baby dressing table in a removable manner by means of a pocket provided by stitching on the underside of the pad or in the form of a flap hingedly connected by stitching to the beading of the underside of the pad at one side thereof and made into a pocket by the securement of laterally extending snap fastener straps secured to the opposite sides of the pad and adapted so that

the pocket can either by extended over an extending lip of the table top or can be wrapped about a tubular open top type of baby dressing table. The pad may have a stiffening member when being used with an open top table and is further secured to the table top by straps extending from the bottom side of the pad. The second pad is hingedly connected at its top to the top edge of the first pad and itself has its own stiffening board for support when opened from the first pad and extended over an open table. Where the table has a top, this pad takes advantage of an extending lip that remains on the old dressing table top since the pad has the pocket which slips over the extending lip.



3,659,298

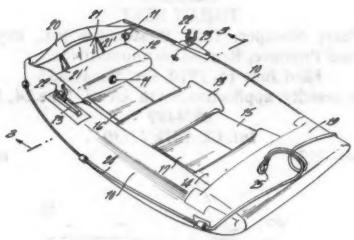
INFLATABLE BOAT

David V. Edwards, Godalming, England, assignor to West Products Corp., Newark, N.J.

Filed May 28, 1970, Ser. No. 41,248

Int. Cl. B63b *7/08*

U.S. Cl. 9—2 A **8 Claims**



An inflatable boat is provided made up of inflatable side tubes, a connecting fabric floor, inflatable aft, midship and forward thwarts between and connecting the side tubes above the fabric floor and below the uppermost level of the inflated tubes, the thwarts when inflated constituting occupant seats, a fabric bow and member fabric stern member and optionally a removable hinged floorboard including stern and forward portions curved in a fore and aft direction together with a rigid transom connected to the stern floorboard. There are keel-like skegs provided for the stern and forward floorboard portion.

In place of the side tubes, a single U-shaped inflatable tube can be utilized.

3,659,299

VARIABLE DISPLACEMENT RECOVERY DEVICES

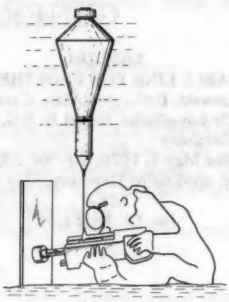
William M. Davidson, and Howard W. Cole, Jr., both of Mountain Lakes, N.J., assignors to Proteus, Inc., Mountain Lakes, N.J.

Filed Dec. 29, 1969, Ser. No. 888,345

Int. Cl. B63c *11/00, 7/00*

U.S. Cl. 9—8 R **8 Claims**

This invention provides controlled buoyancy at depth displacement of water. The apparatus includes an expansible lift bag, a gas source, with a gas delivery device connecting the gas source with the lift bag. A valve controls the supply of gas from the source, while another valve vents gas from the lift bag. Both valves are controlled by ascent velocity sensing devices controlling the supply and vent valves in sequence either to regulate ascent velocity or to suspend a load at



depth. An outer container is provided for packing all components and for attachment of loads.

3,659,300

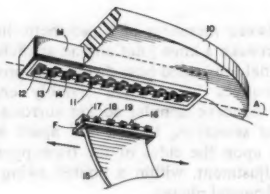
FIN ATTACHMENT STRUCTURE FOR SURFBOARDS

Robert Karl Johnson, Ventura, Calif., assignor to W. A. V. E. Corporation

Filed July 25, 1969, Ser. No. 844,902

Int. Cl. A63c *15/00*

U.S. Cl. 9—310 E **7 Claims**



A means for securing a fin to a surfboard in a desired adjusted longitudinal position is provided in the form of a mounting box imbedded on the under rear surface of the surfboard for cooperation with a fin base structure on the fin. The box defines an elongated channel having a series of enlargements in the form of cavities for cooperation with a series of flanges formed on a longitudinal rib on the fin base. The cavities each include undercut portions for reception of the flanges so that the rib may be inserted in the channel and the entire fin base then urged longitudinally to cause the flanges to engage within the undercut portions of the cavities. By providing converging walls in each of the cavities, a wedging action takes place with respect to the flanges to secure in a very tight position the fin to the surfboard. The desired longitudinal position of the fin relative to the surfboard can be preselected by preselecting portions of the series of the cavities with which the flanges are to cooperate.

3,659,301

FOOTWEAR WITH METHOD AND DEVICE FOR ITS MANUFACTURE

Horace R. Auberry, and Anton Liebscher, both of Waynesville, N.C., assignors to Ro-Search, Incorporated, Waynesville, N.C.

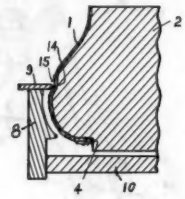
Filed May 4, 1970, Ser. No. 34,003

Int. Cl. A43d *3/00*

U.S. Cl. 12—133 R **1 Claim**

The invention refers to the manufacture of shoes with uppers lasted by pulling a string secured to the lasting margin of

the upper. Improvements are presented which reduce costs of manufacture especially if the sole is molded directly to the



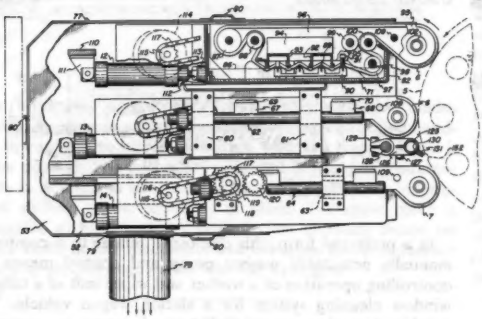
upper. The method of manufacture includes use of a last deformed to obtain preselected location of the lasting margin and to prevent the formation of undesirable spew.

3,659,302

CLEANING APPARATUS

Raymond K. Egnaczak, Williamson, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Nov. 14, 1969, Ser. No. 876,975
Int. Cl. G03g *15/00, 17/00, 19/00*
U.S. Cl. 15—1.5 **15 Claims**



A modular cleaning unit for cleaning relatively smooth surfaces of contaminants. The unit has one or more belts that contact the surface and scrub it. The belts contain fluids to help remove the particles and are electrically biased to attract the particles loosened from the surface. Optionally, lamps radiate the particles to ease removal from the surface. The continuous belts are driven through cleaning fluids and over belt cleaning and wringing devices before passing in contact with the surface to be cleaned.

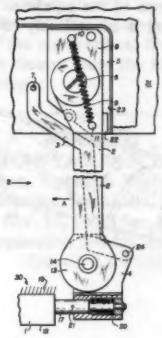
3,659,303

COMBINED DIRT SCRAPER AND BRUSH FOR SHOES

Hermann Schroder, Langenberg, Rhineland, and Ralf Biedron, Bochum-Linden, both of Germany, assignors to Colsman & Kirschner, Essen-Kupferdreh, Germany

Continuation of application Ser. No. 796,306, Jan. 30, 1969, now abandoned. This application Sept. 14, 1970, Ser. No. 72,063
Claims priority, application Germany, Feb. 1, 1968, P 16 80 002.5
Int. Cl. B60r *27/00*
U.S. Cl. 15—112 **16 Claims**

Shoe scraper which can be mounted in an open recess in the bottom of a car door. The scraper is movable between a retracted, folded position, in which it is contained in the recess, and an unfolded position, in which a scraper blade or



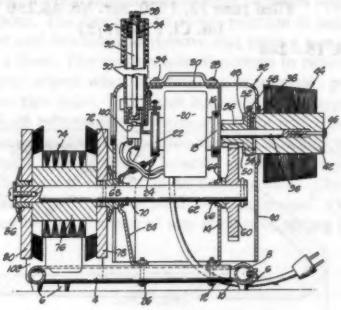
cleaning element is disposed below and spaced from the bottom of the door, generally parallel to the plane thereof.

3,659,304

SHOE CLEANER AND POLISHER

Lloyd H. Leonard, 14877 Valley Vista Blvd., Sherman Oaks, Calif.

Filed Aug. 12, 1970, Ser. No. 63,082
Int. Cl. A47l *23/02*
U.S. Cl. 15—36 **4 Claims**



A shoe cleaner and polisher comprising a pair of motor driven rotary brushes offset from each other and of such heights as to permit the placing of one's shod shoe beneath one brush to brush and polish the top of the shoe and on the top of the other brush to permit cleaning of the bottoms and sides of the soles of the shoe, the brushes having a common power source and being drivingly connected for rotation in opposite directions.

3,659,305

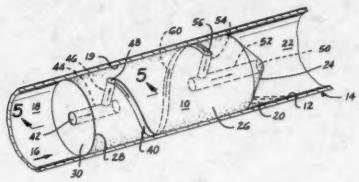
FLEXIBLE PIPELINE PIGS

Marvin D. Powers, 6060 Skyline Drive, Apt. 14, Houston, Tex.

Filed Apr. 6, 1970, Ser. No. 25,998
Int. Cl. B08b *9/04*
U.S. Cl. 15—104.06 R **7 Claims**

A flexible pipeline pig adapted for removing liquids and debris from pipelines. The pig includes at least one plug having a deformable peripheral wall formed of resilient material. The wall defines a peripheral surface which establishes a movable seal with the adjacently surrounding portion of the inner cylindrical wall of the pipe. An arcuate channel defined

by the pipe's inner cylindrical wall, on one side, and a spiral groove in the outer peripheral wall of the plug, on the other side, establishes fluid communication between the upstream and downstream sections of the pipeline. Through the fluid communication channel is controllably routed a fraction of



the pig-propelling fluid which sweeps the pipe's inner wall between the ends of the pig as it moves through the pipeline. The liquids and debris which exist in said channel or on said portion of the pipe's inner cylindrical wall are cleared through said channel and discharged downstream in front of the pig.

3,659,306

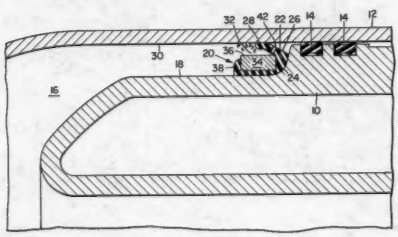
WIPER FOR MACHINED SURFACES

Leon Stoltze, East Hartford, and Fred David Laun, Granby, both of Conn., assignors to The United States of America as represented by the Secretary of the Navy

Filed June 22, 1970, Ser. No. 48,250

Int. Cl. F16j *15/32*

U.S. Cl. 15—246 **2 Claims**



A wiper ring for cleaning the inside wall of the operating cylinder of a hydromatic variable pitch aircraft propeller. The ring has a debris collecting wiper edge and incorporates a plurality of permanent magnets spaced at intervals along its length to attract and hold ferrous particles collected by the wiper edge and prevent them from being abraded into the inside wall of the operating cylinder.

3,659,307

AUTOMOBILE HEADLIGHT CLEANING SYSTEM

Constantine K. Vitou, 2101 Graham Blvd. West, Montreal, 16 Quebec, Canada

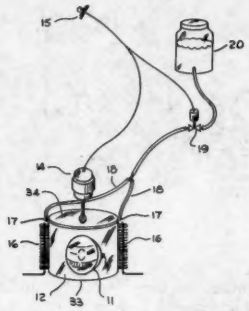
Filed Aug. 22, 1969, Ser. No. 852,174

Claims priority, application Canada, July 22, 1969, 57,720

Int. Cl. A47l *1/00*

U.S. Cl. 15—250.01 **11 Claims**

An automobile headlamp cleaning system which comprises a continuous transparent shield which is mounted about the headlamp and substantially prevents dirt from contacting the headlamp. The transparent shield is cleaned automatically by



rotating it about the headlamp and bringing it into contact with a spray of cleaning fluid and a brush.

3,659,308

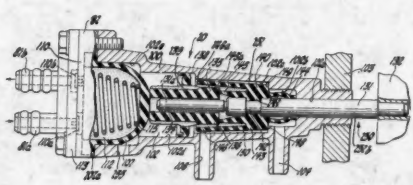
COMBINED FINGER PUMP AND VALVE CONTROL FOR A TAILGATE WINDOW CLEANING SYSTEM

Loren R. Gute, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 7, 1970, Ser. No. 95,693

Int. Cl. B60s *1/48*

U.S. Cl. 15—250.02 **4 Claims**



In a preferred form, this disclosure relates to a combined manually actuatable washer pump and control means for controlling operation of a washer and wiper unit of a tailgate window cleaning system for a station wagon vehicle. The combined washer pump and control means comprises a depressible pumping element and a manually manipulatable actuating means including a pair of serially arranged plungers for controlling communication between a pressure source and a fluid motor of the wiper unit and for depressing the pump to initiate washer unit operation. The actuating means is constructed and arranged such that partial depression thereof will cause the plungers to move relative to each other to effect wiper unit operation alone and full depression thereof will cause conjoint energization of the wiper and washer units.

3,659,309

MEANS FOR ATTACHING THE ARM OF A WINDSHIELD WIPER TO THE BLADE SUPPORT THEREOF

Marcel Besnard, Romainville, France, assignor to Societe Anonyme Pour L'Equipement Electrique des Vehicules S.E.V. Marchal

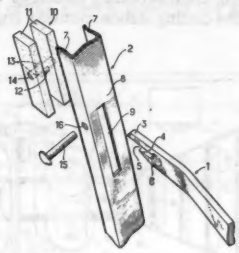
Original application Jan. 30, 1969, Ser. No. 795,261, now Patent No. 3,596,044, dated Apr. 27, 1971. Divided and this application Sept. 8, 1970, Ser. No. 70,079

Int. Cl. A47l *1/00*

U.S. Cl. 15—250.32 **4 Claims**

Means for attaching a windshield wiper arm to a wiper blade support, said means comprising a male member pro-

vided with a cylindrical element having two diametrically opposed flattened surface areas, and a female member having a slot therein equal in width to the diametral distance between



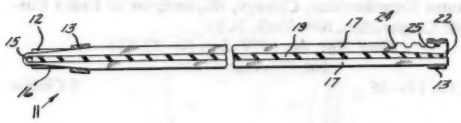
said flattened areas which terminates in a circular seat having a radius equal to that of said cylindrical member, one of said members being made of a plastic material and fastened to said blade support.

3,659,310

SPINE PIECE FOR SQUEEGEE BLADES

Ian K. Rosen, North Muskegon, Mich., assignor to The Wypco Corporation, Muskegon, Mich.

Filed June 3, 1970, Ser. No. 42,977
Int. Cl. B60s *1/38*
U.S. Cl. 15—250.42 **6 Claims**



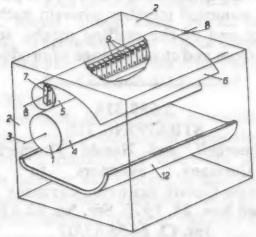
A bifurcated spine piece for securing squeegee blades against bending in one plane while allowing controlled bending to conform to the surface plane to which the squeegee is to be applied. The squeegee is secured between the bifurcations in a selected compression thereby preventing longitudinal shifting of the squeegee or blade. The spine piece is grippable at both ends by typical claw elements found on wiper blade holder assemblies and the spine piece includes a cam grip surface engageable with the squeegee.

3,659,311

MAGNETIC POWDER SCAVENGING ARRANGEMENT

Frank Arthur Oakley Waren, Hove, England, assignor to Creed & Company, Sussex, England

Filed Apr. 22, 1970, Ser. No. 30,730
Claims priority, application Great Britain, May 30, 1969, 27,474/69
Int. Cl. A47l *13/41*; G03g *19/00*
U.S. Cl. 15—256.5 **4 Claims**



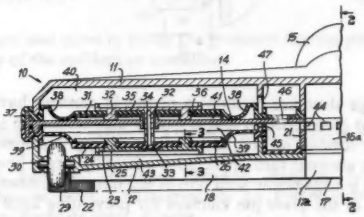
A device for scavenging magnetizable powder from e. g. a drum in a printing apparatus. The powder is attracted from the drum to the surface of a nonmagnetic tube positioned parallel to the drum, which has contained therein a rotatable set of adjacent bar magnets. The rotation of the magnets causes, via the bar magnets' divergent magnetic flux field, the attracted powder to work its way around the surface of the tube in opposite direction to the magnet rotation and onto a ledge extension of the tube surface. The powder eventually is moved sufficiently distant from the field to enable it to fall into a collector trough.

3,659,312

MULTI-PURPOSE VACUUM CLEANER NOZZLE

Bo Gunnar Mattsson, Upplands Vasby, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Nov. 25, 1970, Ser. No. 92,695
Claims priority, application Sweden, Nov. 28, 1969, 16382/69
Int. Cl. A47l *9/02*
U.S. Cl. 15—319 **6 Claims**



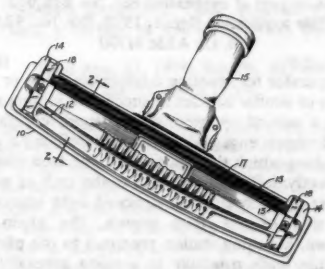
A multi-purpose vacuum cleaner nozzle has a suction inlet which is movable over a porous object like a rug to remove dirt therefrom. A brush is mounted on the nozzle at the vicinity of the suction inlet for movement between upper and lower positions. The brush in its lower position is below the suction inlet and functions to remove dirt from a non-porous object like a floor. The suction inlet functions to remove dirt from a porous object when the brush is in its upper position above the suction inlet. The brush is moved to its upper and lower positions by a variable pneumatic force which acts upward or downward depending upon the rate at which air at a partial vacuum flows per unit interval of time in a path of flow from the suction inlet to an air outlet socket. The variable pneumatic force is produced by mechanism which is characterized by the absence of any springs or spring biasing means.

3,659,313

VACUUM CLEANER NOZZLE

William E. Ferris, Stamford, Conn., assignor to Consolidated Foods Corporation, Old Greenwich, Conn.

Filed Dec. 9, 1968, Ser. No. 782,348
Int. Cl. A47l *9/06*
U.S. Cl. 15—402 **1 Claim**



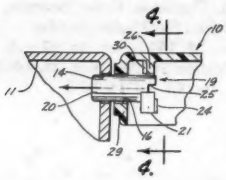
A suction nozzle for a vacuum cleaner in which a rod having a knurled surface is provided in a rug cleaning surface for loosening lint, hair, thread and such litter on the rug surface

so that this litter is entrained in the airflow through the nozzle opening.

3,659,314
HINGE STRUCTURE

Frank E. Ross, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed July 22, 1969, Ser. No. 843,380
Int. Cl. A47g *27/04*
U.S. Cl. 16—168 **2 Claims**



A hinge structure includes a pivot pin element having an elongated pivot portion and is axially insertable into a hinge pin hole formed in one of a pair of hinged members. The pivot pin element further includes a radially larger head portion that is engageable with one of the hinged members upon rotation of the pivot pin element for preventing axial movement of the pivot pin element from the operative position.

3,659,315
PROCESS OF CLAM EVISCERATION

Ronald K. Finley, Towson; Donald J. Langlois, Pasadena, both of Md., and Robert H. Nicholson, Lewes, Del., assignors to HCA Food Corporation, Baltimore, Md.

Filed Nov. 5, 1970, Ser. No. 87,293
Int. Cl. B01d *43/00*
U.S. Cl. 146—222 **7 Claims**

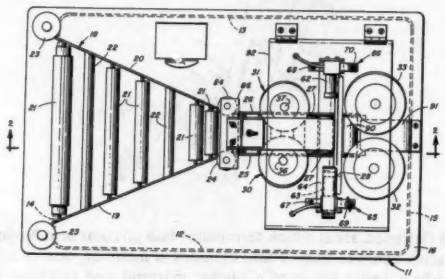
A method for effecting the separation of visceral material from shucked clams is disclosed. Clean clam meat in essentially viscera-free form is obtained by subjecting shucked uneviscerated clam pieces to agitation in a hot aqueous medium for a controlled period of time. As a result of this step, the visceral material is transferred to the liquid medium and remains as a fully liquid body which can be separated from the pieces of clam meat. The recovered clam pieces may then be washed to remove any residual liquid or small fragments which remain on the surfaces of the pieces.

3,659,316
LINK SEPARATOR

Gerald C. Berendt, 32 Dale Drive, Chatham Tsp., Morris County, and Leslie B. Melanson, Bay Isle Drive, Point Pleasant, both of N.J.

Continuation-in-part of application Ser. No. 846,042, July 30, 1969. This application Dec. 1, 1970, Ser. No. 93,991
Int. Cl. A22c *11/00*
U.S. Cl. 17—1 F **10 Claims**

A link separator for severing a continuous link or chain of frankfurters or similar articles at successive joining segments comprising a pair of opposed, spaced-apart, contra-rotating driven feed wheels engageable with and defining a generally axial path along which the chain is fed, the feed wheels each being resiliently deflectable normal to the path of movement of the chain, a photocell and opposed light source on the emergent side of the feed wheels, the chain passing therebetween, a cutting station proximal to the photocell, a relatively thin knife rotatable in a plane generally perpendicular to and extending through the longitudinal axis of each successive joining segment, drive and control means for the knife whereby the knife rotates through a fixed arc only once for each joining segment, the control means being governed by a signal from the photocell generated by the presence of a joining segment, the rotation of the knife being timed to sever each successive joining segment, and a pair of spaced apart, power driven, contra-rotating discharge wheels on the emergent side of the cutting station mutually engageable with

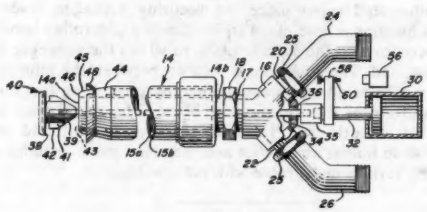


each severed frankfurter, the discharge wheel on the side of each frankfurter opposite the direction of movement of the knife being resiliently deflectable generally normal to the path of movement of the frankfurters, the other discharge wheel being undeflectable.

3,659,317
STUFFING APPARATUS

Vytautas Kupcikevicius, Chicago, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 30, 1970, Ser. No. 23,934
Int. Cl. A22c *11/06*
U.S. Cl. 17—35 **8 Claims**



Apparatus is disclosed for stuffing a conglomerate meat mass into a flexible container which comprises a stuffing means, shut-off and/or severing means mounted on the outlet end of said stuffing means comprising a member mounted on the outlet end of the stuffing means and a cooperating moving member adjacent to and aligned with said mounted member and means for advancing and retracting said cooperating moving member into and out of positive engagement with said mounted member wherein such engagement seals said outlet end of the stuffing means, severs product protuding therefrom and stops passage of product therefrom.

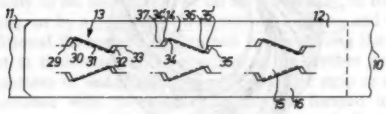
3,659,318
STRAPPING TIE

Eberhard Timmerbell, and Harald Timmerbell, both of Schwelm, Germany, assignors to Titan Verpackungssysteme GmbH, Schwelm, Germany

Filed Nov. 24, 1970, Ser. No. 92,438
Int. Cl. B65d *63/02*
U.S. Cl. 24—20 EE **13 Claims**

A metal tape has spaced end portions each of which is formed with a plurality of locking catches with those of one

end portion being adapted for engaging those of the other end portion in overlapping relationship of the end portions. Each locking catch comprises an elongated strip portion deformed out of the general plane of the tape and bounded



at opposite sides of the longitudinal plane of the tape by a pair of lateral edges each of which has a pair of projections extending transversely of the tape and outwardly away from the longitudinal axis of the latter.

3,659,319

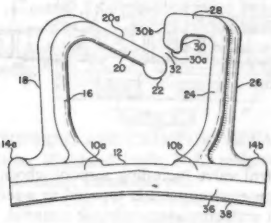
ADHESIVE WIRE ROUTING CLIP

Lloyd A. Erickson, 8501 West Higgins Road, Chicago, Ill.

Filed Nov. 30, 1970, Ser. No. 93,599

Int. Cl. A44b *21/00*; F16l *3/08*

U.S. Cl. 24—73 AP **5 Claims**



A routing clip for mounting conduits, electrical conductors. tubing and similar workpiece elements, and having a base with outwardly extending posts terminating in inwardly directed hook-like extensions with the free ends thereof relatively underlying one another with respect to the base and in spaced relationship to form a relatively narrow entrance throat to trap included workpiece element; the base being somewhat flexible for attachment thereof, as by adhesive means, to other than perfectly flat surfaces, such as surfaces curved on a relatively large radius, and without substantially changing the size of the entrance throat.

3,659,320

FASTENER ASSEMBLY

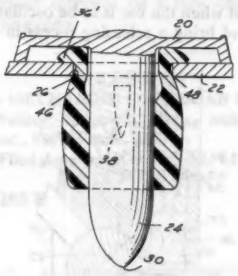
Engelbert A. Meyer, Union Lake, Mich., assignor to USM Corporation, Warren Division, Mount Clemens, Mich.

Filed July 9, 1971, Ser. No. 161,142

Int. Cl. F16b *5/12*, *13/04*

U.S. Cl. 24—73 HS **5 Claims**

A fastener assembly for securing an emblem, medallion or the like provided with a plurality of projecting pins to a panel member having a plurality of apertures therethrough corresponding in number and spacing to said pins, with a plastic grommet disposed in each aperture, each grommet having a reduced internal diameter portion, whereby upon insertion of the pin, the grommet walls will expand into sealing engagement about the panel aperture and also tightly frictionally engage the pin surface to retain the emblem against the panel. The grommet may be additionally provided with a pair of radially projecting protuberances which are resiliently deformable upon insertion of the grommet through the panel



aperture, and serve to retain the grommet therein prior to assembly of the emblem or medallion.

3,659,321

MULTIPLE WEDGE ANCHORAGE DEVICE FOR PRESTRESSING TENDONS

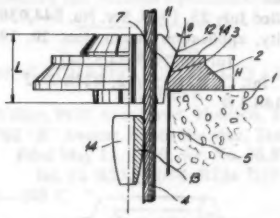
Michel Laurent, Bagnolet, France, assignor to Societe Technique Pour L'Utilisation De La Precontrainte, Boulogne, Hauts de Seine, France

Filed June 12, 1970, Ser. No. 45,643

Claims priority, application France, June 24, 1969, 6921121

Int. Cl. F16g *11/04*, *11/10*

U.S. Cl. 24—122.6 **3 Claims**



The units of a prestressing cable made of multiple parallel tendon units are individually clamped between two wedges of a crown of wedges clamping all the units being itself located in a frusto-conical hole of a bearing part of which the apex angle is greater than 15°.

3,659,322

LOCKING DEVICE FOR RELEASABLE STRAP CONNECTORS

John A. Gaylord, Greenbrae, Calif., assignor to A. Koch & Sons, Inc., a divsion of Global Systems, Corte Madera, Calif.

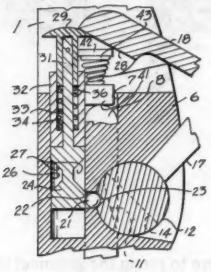
Filed Aug. 21, 1970, Ser. No. 65,908

Int. Cl. A44b *19/00*

U.S. Cl. 24—230 **7 Claims**

In a releasable strap connector wherein the male member has at least one prong insertable into a socket in the female member, which socket is intersected by a transverse oscillating bar cut away at the intersection so as to leave the socket unobstructed for the insertion of the prong before being resiliently urged into an obstructing position into engagement with a notch in the prong to hold the prong connected, and wherein levers are employed for oscillating the bar from an obstructing to an unobstructing position for the release of the prong; the improvement of a safety lock for directly locking the oscillating bar against accidental oscillation which includes a ball in the female connector spaced from said socket

but engaging a keeper recess in the oscillating bar and being held there by a plunger which plunger is held in a guide by a spring in such locking position; a part of a lever in the manipulating device for the oscillating bar is engageable with the plunger about when the bar is to be oscillated to push the plunger down and bring a releasing recess in the plunger in



registry with the ball thereby to release the lock. A spring pressed ejector associated with the plunger guide and slideable in the female member urges the unobstructed prong out of the socket and continues to hold the plunger in the unlocking position until the prong is again inserted so as to push the guide and the plunger up into the locking position.

3,659,323

A METHOD OF PRODUCING COMPOUND CAST ROLLS

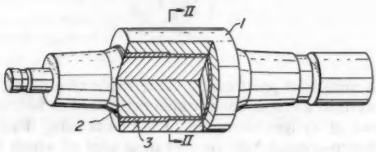
Mikio Hachisu; Chikanori Saito; Osamu Sitamura, and Yasuo Nambu, all of Katsuta-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed July 23, 1969, Ser. No. 844,038

Claims priority, application Japan, Jan. 20, 1969, 44/3432; July 26, 1969, 44/52442

Int. Cl. B21d *53/12;* **B21h** *1/12*

U.S. Cl. 29—148.4 D **11 Claims**



A compound cast roll comprising a shell made of a steel having excellent rolling properties, an arbor having a body portion made of a steel or iron having high toughness and a cylindrical partition member interposed between said shell and said core, said three members being metallurgically connected together into an integral body and subjected to a heat treatment to impart desired properties to said shell and said core.

3,659,324

METHOD FOR MANUFACTURING AN AXIAL BEARING

Hans E. H. Murray, Lerum, Sweden, assignor to Aktiebolaget Svenska Kullagerfabriken, Goteborg, Sweden

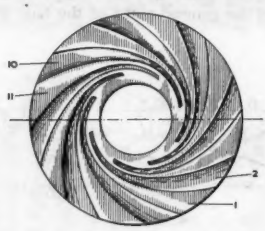
Filed Feb. 20, 1970, Ser. No. 12,934

Claims priority, application Netherlands, Feb. 24, 1969, 6902851

Int. Cl. B21d *53/10;* **B23p** *13/04*

U.S. Cl. 29—149.5 PM **8 Claims**

A method of manufacturing an axial bearing part made of a sintered metal powder having a carbon content of less than 0.1 percent and having a plurality of spiral grooves in at least one face thereof consisting of the steps of forming in a pressing die a plurality of grooves corresponding to the ridges between the grooves in the bearing part, grinding the die face



smoothly and thereafter pressing the die face in the bearing part to form the spiral grooves.

3,659,325

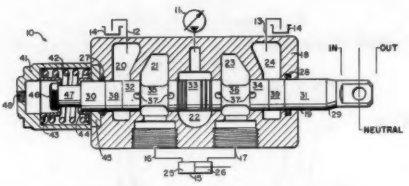
CONTROL VALVE METHOD OF MANUFACTURE

Robert D. Krehbiel, and Warren E. McCammond, both of Hutchinson, Kans., assignors to The Cessna Aircraft Company, Wichita, Kans.

Original application Nov. 1, 1968, Ser. No. 772,668,. Divided and this application June 3, 1970, Ser. No. 54,033

Int. Cl. B21d *53/00;* **B21k** *29/00;* **B23p** *15/26*

U.S. Cl. 29—157.1 R **4 Claims**



A fluid control valve including a spool whose end exposable to corrosion environment is tapered to a reduced diameter and coated with corrosion resistant material. The reduced diameter facilitates fast, economical final machining and sizing of the spool without damaging the protective coating, for selective fitting within a fluid control valve body bore.

3,659,326

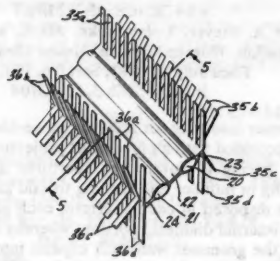
PROCESS FOR PREPARING HEAT EXCHANGE COMPONENT

Norval A. Keith, East Alton, Ill., assignor to Olin Corporation

Continuation-in-part of application Ser. No. 708,463, Dec. 7, 1967, now abandoned , and a continuation-in-part of 774,577, Nov. 1, 1968, now Patent No. 3,495,657, which is a division of application Ser. No. 630,376, Apr. 12, 1967, now abandoned. This application Feb. 2, 1970, Ser. No. 7,729

Int. Cl. B21d *53/00;* **B21k** *29/00;* **B23p** *15/26*

U.S. Cl. 29—157.3 V **28 Claims**



A process of producing continuous strip having at least one fluid passageway with integrally formed fin members, which

comprises forming a pattern of weld inhibiting material on a first strip or sheet with a portion of the pattern defining the fluid passageway, and a further portion of the pattern extending along the edge of the strip or sheet defining a fin surface. A second strip or sheet of metal is pressure welded to the first strip or sheet in substantially all areas not containing the weld inhibiting material and the fin surface is formed into a plurality of fin members. The fin members may be formed by cutting, or by a combination of cutting, bending and twisting. Additional fin surface is obtained by separating the strip or sheet at their edge corresponding to the further portion of the pattern of weld inhibiting material. The strip or sheet, in accordance with the invention, may be formed into heat exchangers of any desired shape including a helix, spiral or serpentine.

3,659,327

METHOD OF MAKING CAST PICTORIAL REPRODUCTION

James J. Beverick, 1202 North 5th Street, Sandusky, Ohio, and David P. Winters, 1300 1/2 Croghan Street, Fremont, Ohio

Filed Mar. 13, 1970, Ser. No. 19,475
Int. Cl. B21f *43/00*; B23p *13/00*
U.S. Cl. 29—160.6 **7 Claims**

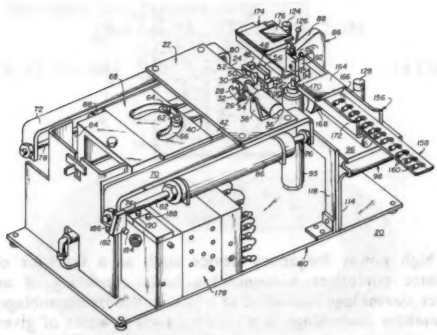
A reproduction in castable material of a photo or other form of picture and a method of producing the cast picture. A photo or other desired form of scene is reproduced as a black and white negative with shading eliminated, and the negative is processed to produce a likeness thereof in the castable material with the dark lines standing in relief and the light areas recessed. The recessed areas are filled with powdered enamel to a level somewhat below the top of the relief features, and the object is baked to fuse the enamel and bond it to the casting.

3,659,328

STRIPPING AND CRIMPING APPARATUS

Avigdor Klein, Highland Park, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Aug. 17, 1970, Ser. No. 64,516
Int. Cl. H01r *43/04*
U.S. Cl. 29—203 D **23 Claims**



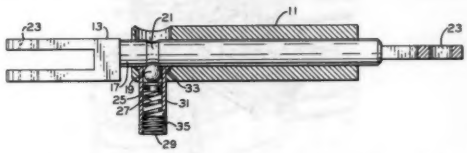
The invention is directed to an improved, compact, pneumatically actuated semi-automatic stripping and crimping apparatus having means for transferring a stripped conductor in a single, direct linear path from a stripping zone to a crimping zone. Adjustable crimping means comprising a pair of releasable die members is disposed in direct linear alignment forward of the stripping zone. Wire holding and transfer means, disposed adjacent stripping means which is planarly rotatable away from the stripping zone, is reciprocatingly displaceable in a direct linear unobstructed path between the stripping zone and the crimping zone. Terminal feed means comprising a channel-like terminal guide member and a reciprocating, resiliently mounted pawl is provided to intermittently advance a plurality of conductor terminating connectors selectively disposed on a tape carrier towards and into the crimping zone.

3,659,329

FEED MECHANISM OVERLOAD RELEASE

Robert G. Walker, Brighton, Mich., assignor to Industra Products, Inc., Fort Wayne, Ind.

Filed Aug. 6, 1970, Ser. No. 61,681
Int. Cl. H02k *15/00*
U.S. Cl. 29—205 E **5 Claims**



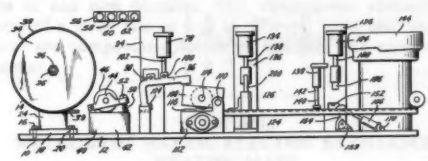
A connecting link for transmitting linear motion along its axis to feed bore wedges of insulating material and having an overload release mechanism is disclosed. The connecting link consists of an outer link, and an inner link slidable relative to the outer link in the direction of transmission of the force. The inner link is provided with a recess and the outer link is provided with a spring loaded plunger arrangement which engages the recess and which yields allowing the relative sliding of the inner and outer links when the force being transmitted by the connecting link exceeds a predetermined value.

3,659,330

BINDING STRIP MEASURING AND ASSEMBLY MACHINE

Frank De Villier, 9930 Aves Street, Houston, Tex., and Brown Isaacs, 702 "B" Avenue, South Houston, Tex.

Filed May 12, 1970, Ser. No. 36,572
Int. Cl. B23p *19/04*; B23a *7/10*
U.S. Cl. 29—208 C **11 Claims**

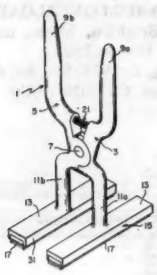


A machine for automatically assembling a binding clip to one extremity of a strip of metal material, measuring a desired length of the strip material and severing the desired length of strip material from a storage roll. The machine is provided with a strip guide bar having a strip guide groove formed therein. A brake mechanism, a strip drive mechanism, and a strip extremity immobilizing mechanism, are disposed adjacent the strip guide groove to control movement of the strip material. A strip cutter, a strip binding apparatus, and a clip fastening device are provided adjacent the strip guide groove to perform cutting, bending, and fastening operations on the strip material. A clip orienting and feed device is provided to orient binding clips so that a clip may be connected to the free extremity of the strip material. Control of the entire mechanism is achieved by an adjustable sequence timing control device which is responsive to linear movement of the strip material being driven.

3,659,331
CLAMPING APPARATUS

Jack W. Drake, and Roger L. Case, both of Indianola, Iowa, assignors to Commercial Affiliates, Inc.,, New York, N.Y.

Filed Mar. 20, 1970, Ser. No. 21,270
Int. Cl. A47g *27/04;* B25b *7/00*
U.S. Cl. 29—268 7 Claims

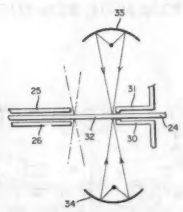


A clamping apparatus having two members pivotally joined together to form a squeeze handle means on one side of the point of juncture and a pair of leg portions on the other side. Each leg is attached to a contact member which has a plurality of pin members on its lower surface and a flat clamping side surface facing the other contact member. A spring urges the contact members towards one another when the handle is released from a squeezed position.

3,659,332
METHOD OF PREPARING ELECTRICAL CABLES FOR SOLDERING

Ross F. Morrone, Trenton, N.J., assignor to Spectra Instruments, Inc., Trenton, N.J.

Filed May 5, 1969, Ser. No. 821,834
Int. Cl. B23p *19/02*
U.S. Cl. 29—427 4 Claims



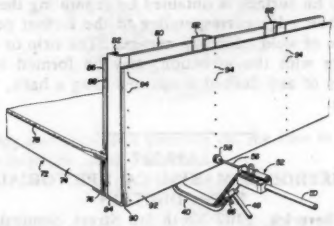
The disclosure relates to a method for using infra-red, ultra-sonic and mechanical energy in certain desired combinations for the purpose of removing insulating plastic from flat, flexible electrical cables.

3,659,333
METHOD AND APPARATUS FOR CONSTRUCTION OF MODULAR BUILDINGS

John A. Johnson; Nicholas F. Alberti, and Joseph E. Schuette, all of Fort Lauderdale, Fla., assignors to Behring Corporation, Fort Lauderdale, Fla.

Filed Apr. 9, 1970, Ser. No. 26,953
Int. Cl. B23k *31/02*
U.S. Cl. 29—471.1 9 Claims

In constructing a modular building, a floor frame and a wall frame are assembled at a right angle, with a perimeter beam of the floor frame next to the inner faces of vertical studs of the wall frame. Since the outer faces of the studs are covered by surfacing material, they are not accessible for welding, so a welder and pressure device, both mounted on the same support, are positioned to place the welder inside the perimeter beam opposite a stud and the pressure device on the outer side of the wall frame next to the surfacing material. The welder may be aligned with a stud by aiming

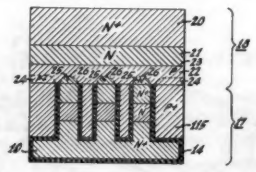


the pressure device relative to a reference which may be fasteners in the surfacing material. The pressure device is operated to apply force to the wall frame and thus press the welder against the perimeter beam. The welder is operated to make the weld, and the sequence is repeated to make further welds. The method and the apparatus are claimed.

3,659,334
HIGH POWER HIGH FREQUENCY DEVICE

Hans W. Becke, Morristown; Eric F. Cave, Somerville, and Daniel Stalnitz, Raritan, all of N.J., assignors to RCA Corporation

Original application June 19, 1968, Ser. No. 738,343, now abandoned. Divided and this application Oct. 13, 1970, Ser. No. 80,415
Int. Cl. B01j *17/00;* H01l *5/00*
U.S. Cl. 29—580 3 Claims



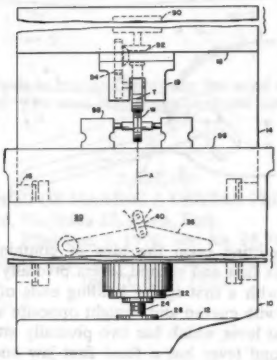
A high power frequency device such as a thyristor or transistor comprises a monolithic body consisting of an emitter assemblage laminated to a base-collector assemblage. The emitter assemblage is a semiconductive wafer of given conductivity type having a plurality of mesas adjacent one surface; a high resistivity ballast layer in each mesa; an insulating film on said one surface and around each mesa; and a layer of high conductivity material, such as heavily doped semiconductive material of opposite conductivity type, on said insulating film over said one surface and surrounding said mesas, the surface of said high conductivity layer being co-planar with the top of said mesas. The base-collector assemblage is a semiconductive wafer which includes at least two layers of mutually opposite conductivity types, the surface of one layer being planar and constituting a major surface of said body.

3,659,335

COMBINED GEAR SHAVING AND ROLLING MACHINE

Benjamin F. Bregi, Grosse Pointe Shores; Carl H. Motz, Harper Woods, and Arthur B. Bassoff, Oak Park, all of Mich., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Filed Sept. 29, 1969, Ser. No. 861,594
Int. Cl. B23f 19/06
U.S. Cl. 29—560 15 Claims



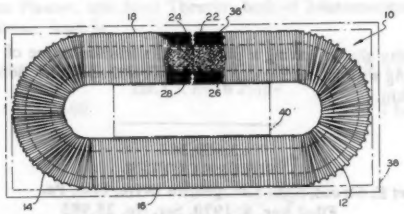
A machine which can be used selectively for crossed axes gear shaving employing a gear-like shaving cutter having cutting edges in the sides of its teeth, and as a gear rolling machine employing a die in the form of a hardened gear. Provision is made for relative traverse while shaving in a direction occupying a plane parallel to the axes of the gear and tool, and for incremental infeed during shaving and continuous infeed during gear rolling.

3,659,336

METHOD OF MANUFACTURING AN INDUCTIVE DEVICE

Arthur P. Horne, Portland, Oreg., assignor to Electronic Diversified, Inc., Portland, Oreg.

Filed Jan. 30, 1970, Ser. No. 7,039
Int. Cl. H01f 7/06
U.S. Cl. 29—605 14 Claims



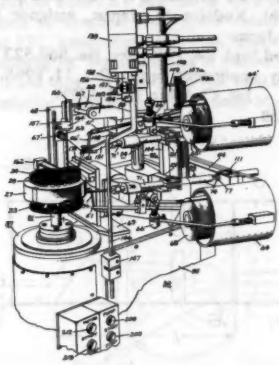
An inductive choke coil comprises a multi-layer toroidal coil enclosing a core formed from powdered iron and a binder. The coil is first wound in linear fashion, after which a flexible tubular member is inserted therewithin and filled with the core material. The coil is then formed into a toroid, and the binder material is activated for forming a substantially continuous core.

3,659,337

APPARATUS AND METHOD FOR TYING COILS

Roy E. Gawthrop, and Lowell M. Mason, both of Fort Wayne, Ind., assignors to General Electric Company

Continuation of application Ser. No. 812,631, Apr. 2, 1969, now abandoned. This application Feb. 9, 1971, Ser. No. 114,085
Int. Cl. H01f 41/02
U.S. Cl. 29—606 25 Claims



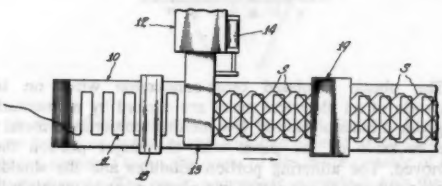
Apparatus and method for concurrently tying cord about two sets of end turn portions of coils projecting beyond each side surface of a magnetic core. The core having coils is supported in a holder assembly and periodically indexed through an angular path of travel by an assembly having adjustable arms. Each set of end turn portions is tied with cord in a stitch pattern having double loops in each stitch interval by a tying unit having a cord feeder member, mounted for combined longitudinally swinging and turning motion, which passes over the associated set of end turn portions and cooperates with an elongated hook member, mounted for combined rectilinear and oscillatory motion. One tying unit is carried for preselected movement by a movable platform, and a core-surface and tying unit position-sensing and controlling unit automatically determines the relative positions of the one tying unit with respect to an adjacent region of an associated core surface. Thus, desirable stitch patterns are simultaneously, quickly, and efficiently provided for the two sets of end turn portions. Also, dimensional variations in cores of a given size as well as different sized and types of cores are compensated for in an effective and economical manner.

3,659,338

METHODS OF MAKING ELECTRIC RESISTANCE HEATING MATS

William McFarlane, Murfreesboro, Tenn., assignor to Emerson Electric Co.

Original application Aug. 23, 1967, Ser. No. 662,796. Divided and this application June 29, 1970, Ser. No. 60,165
Int. Cl. H06b 3/00
U.S. Cl. 29—611 9 Claims



The method of making an electric heating mat including disposing laterally spaced portions of electric resistance wire

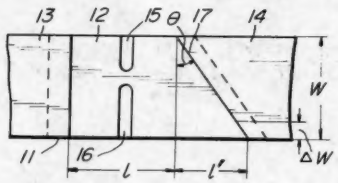
on a support, disposing a plastic extrusion head over the support and extruding a strand of plastic downwardly toward the wire portions, and relatively moving the support and extrusion head to lay the downwardly extruded strand cross-wise of and over the wire portions, the strand adhering to the portions at the places of crossing to form a dielectric strand connection between the wire portions.

3,659,339

METHOD OF MAKING A FILM RESISTOR

Isao Yamaguchi, Kodaira-shi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sept. 24, 1969, Ser. No. 860,523
Claims priority, application Japan, Oct. 11, 1968, 43/73529
Int. Cl. H01c *7/00, 17/00*
U.S. Cl. 29—620 **8 Claims**



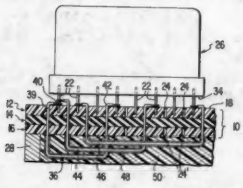
A method of making a resistor comprising the steps of depositing resistor materials onto a substrate in the form of a film and connecting conductors to the two ends thereof, wherein the said resistor film is formed so that it includes a first part where the current path between the said conductors is long and a second part where the current path is short, and first and second ditches are provided in the said first and second parts of the resistor film in a direction crossing the direction of the current so as to adjust the resistance between the said two conductors to the desired values.

3,659,340

METHOD OF FABRICATING COAXIAL WIRES IN BACK PANELS

Gary R. Giedd, and Merlyn H. Perkins, both of Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of application Ser. No. 606,129, Dec. 30, 1966, now abandoned. This application Dec. 16, 1969, Ser. No. 885,639
Int. Cl. B41m *3/08;* **H01b** *13/00*
U.S. Cl. 29—627 **8 Claims**



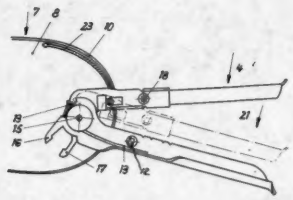
The plastic insulated cross-connection wires on the backside of an electrical panel are coaxed by momentarily applying a mass of molten, low melting temperature metal to the backside of the panel with the major portion then removed. The adhering portion solidifies and the shielded cross-connections are potted in a plastic mass to maintain the wires in position and to protect the same against mechanical impact.

3,659,341

TOOL FOR OPENING CONTAINERS HAVING A BEADED TOP

Karl Kappler, Hauptstrasse 5, Pfinzweiler, Wurttemberg, Germany

Continuation-in-part of application Ser. No. 661,106, Aug. 16, 1967, now Patent No. 3,514,583. This application Mar. 30, 1970, Ser. No. 23,582
Int. Cl. B67b *7/30*
U.S. Cl. 30—14 **3 Claims**



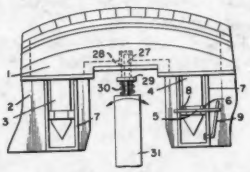
A tool for cutting open the tops of containers having beaded tops has first and second levers pivotally connected near one end with a first spring holding ends of the levers apart. A knife with curved and straight opposite sides is carried on the first lever which has two pivotally attached sections. The second lever has a fixed first jaw and carries a spring biased pivotable lever formed with a second jaw having a projecting tooth, which engages under the bead of a container and holds the second lever stationary, while the first lever draws the knife along the top of the container cutting the top and forming a peripheral turned up lip in the cut top.

3,659,342

MECHANICAL RAZORS

Paul Kobler, 81 Fenimore Street, Lynbrook, N.Y.

Filed Oct. 21, 1969, Ser. No. 868,052
Int. Cl. B26b *19/00*
U.S. Cl. 30—43.1 **5 Claims**



A dry shaver having a plurality of shearheads one of them moving with its cutting surface sideways through friction with the skin.

3,659,343

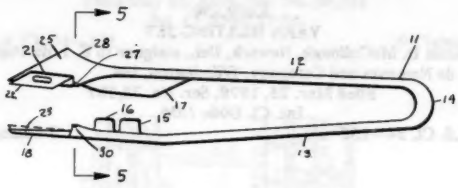
SUTURE CUTTER

Albert E. Straus, 5844 Georgetown Drive, Erie, Pa.

Filed Apr. 6, 1970, Ser. No. 25,983
Int. Cl. B26b *17/04*
U.S. Cl. 30—124 **2 Claims**

This specification discloses a cutter for use by physicians to cut and remove sutures. The suture cutter has a handle made of resilient material having two arms resiliently and integrally connected together. The arms have the cutting elements supported on the distal ends. The cutting elements are a sharp blade connected to one arm and an anvil surface on a probe on the other arm. The elongated resilient probe may be inserted under a suture during cutting. To lift the suture a

rigid laterally extending jaw is attached to each side of each arm which close together when the cutter is closed and act as tweezers. Thus the combination cutter and tweezers actually



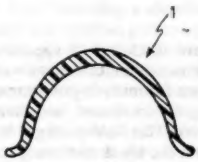
form two tools in one and eliminate the need of two separate instruments. The tool is shaped for hand comfort and ambidexterity.

3,659,344

METHOD OF MAKING A DENTAL PROSTHESIS

Leo Gavazzi, Via Italia 13, Biella, Italy

Filed Dec. 7, 1970, Ser. No. 95,780
Claims priority, application Italy, Dec. 15, 1969, 54390 A/69
Int. Cl. A61c *13/00*
U.S. Cl. 32—2 **5 Claims**



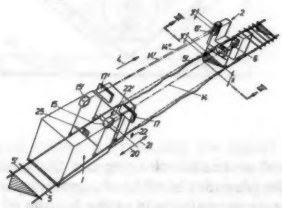
A denture is formed by a rigid acrylic resin tooth-bearing support element and an underlying cushion element of soft thermoplastics material. The cushion element and the support element are interlocked by the process of the invention, which entails sticking irregularly shaped thermoplastics granules on the outer surface of the preformed cushion element, and then pressing the latter into the preformed support element, before the latter is polymerized. The subsequent application of heat melts the granules to form integral undercut appendages on the cushion element, and also polymerizes the acrylic resin, hardening the support element and thereby interlocking the two elements.

3,659,345

MOBILE TRACK SURFACING APPARATUS

Franz Plasser, and Josef Theurer, both of Johannesgasse 3, Vienna, Austria

Filed Nov. 5, 1970, Ser. No. 87,166
Claims priority, application Austria, Dec. 19, 1969, 11907
Int. Cl. E01b *29/04*
U.S. Cl. 33—60 **7 Claims**



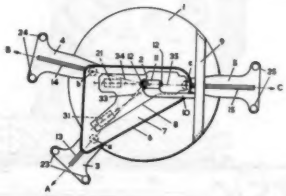
In a track grading machine, which operates with two reference beams associated with respective rails and wherein the beam stops and receivers are held at a constant distance from the rails, drive motors are provided for automatically adjusting the vertical position of each beam transmitter independently. The drive motors are operated in response to any deviation of the track from the horizontal, taking into account the different between the actual and the desired superelevation.

3,659,346

POSITION DISPLAY METHOD AND DEVICE

Gerrit Hendrik Te Kronnie; Karel Hero Volkers, both of Van Breestraat 171, Amsterdam, and Poul Albert Poulsen, Bezuidenhontseweg 74, Wassenaar, all of Netherlands

Filed May 13, 1969, Ser. No. 824,193
Claims priority, application Netherlands, May 16, 1968, 6806926
Int. Cl. G01c *21/22*
U.S. Cl. 33—65 **4 Claims**



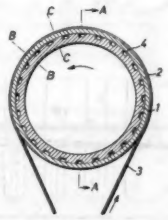
A method and device for displaying on a chart the position and orientation of a relatively large moving vehicle, such as a ship, in which the chart is moved so as to bring three selected points thereof on the lines of sight from an observation station on the vehicle to three remote objects corresponding to such selected points, and in which an outline projection of the vehicle at the scale of the chart is made visible on the chart, said projection having a fixed orientation with respect to the vehicle itself.

3,659,347

METHOD AND MEANS FOR DRYING MOIST MATERIAL, SUCH AS PAPER, CELLULOSE, OTHER FIBRES OR THE LIKE

Hans I. Wallsten, Saffle, Sweden, assignor to AB Inventing, Saffle, Sweden

Filed Aug. 10, 1970, Ser. No. 62,428
Claims priority, application Sweden, Aug. 13, 1969, 11294/69
Int. Cl. F26b *3/00*
U.S. Cl. 34—9 **10 Claims**



A method and means for drying moist material in which heat from a source of heat is supplied at least partially to one side of a porous layer, the pores of which are capable of conducting vapor. The moist material is in contact with the opposite side of the porous layer, so that due to the heat from the source of heat the moisture in said moist material is vaporized to vapor which thus is generated as a result of

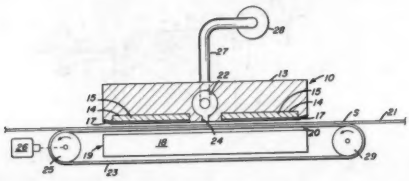
evaporation of moisture in said moist material and is at least partially forced into and through said porous layer in a direction opposite to that of the temperature gradient caused by heat supplied mainly by means of thermal conductivity from the source of heat to the porous layer through a homogeneous, heat-conducting wall. The wall is arranged in at least partial heat-conducting contact with the porous layer and defines a partition between the porous layer and the source of heat, blocking the passage of steam through said porous layer. The generated vapor is discharged in direction mainly perpendicular to said temperature gradient.

3,659,348

APPARATUS FOR FUSING XEROGRAPHIC TONERS

Lee F. Frank, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 27, 1970, Ser. No. 40,841
Int. Cl. F26b *11/02*
U.S. Cl. 34—122 **6 Claims**



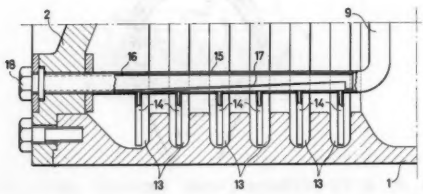
A device for thermofusing an electroscopic toner image to the surface of a support by moving the support through a passageway formed by a pair of platens, at least one of which is heated. The heated platen is connected to an air supply, the air being discharged under pressure through a slot in the heated platen and directed toward the image-bearing surface. The air is heated as it is discharged and attains a temperature sufficient to fuse the toner image. The air pressure is sufficient to hold the support in a spaced relation with respect to the heated platen. In another embodiment, a vacuum platen is arranged adjacent the other surface of the support, the applied vacuum or suction drawing the thin layer of air on the image-bearing surface through the support to increase the efficiency of the device by utilizing the heated air more effectively.

3,659,349

DRYING CYLINDER

Erik A. Nykopp, Tampere, Finland, assignor to Oy-Tampella Ab, Tampere, Finland

Filed Nov. 26, 1969, Ser. No. 880,345
Int. Cl. F26b *11/02*
U.S. Cl. 34—124 **3 Claims**



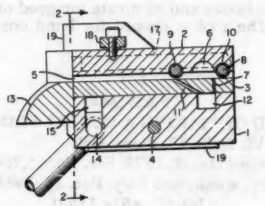
A drying cylinder in which the inside of the mantle or at least its end portions have circumferential grooves for collecting condensate. The inlet of a condensate drain pipe is placed in each groove and the pipes have been joined to a common condensate collecting pipe having adjustment means for regulating the amount of condensate from the drain pipes. The condensate collecting pipe is further connected to a condensate draining system of the cylinder.

3,659,350

YARN HEATING JET

James D. McCullough, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 25, 1970, Ser. No. 22,507
Int. Cl. D06c *1/06*
U.S. Cl. 34—155 **5 Claims**



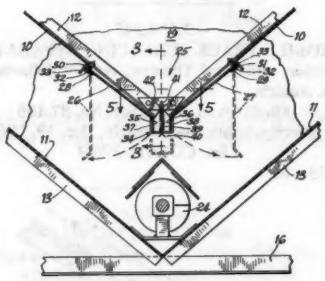
Improvements are disclosed in apparatus for fluid heat-treatment of continuous multifilament yarn. These include 90° impingement jets for initiating treatment, 30° impingment jets for completing the treatment, and means for redirecting fluid against the yarn. Hot fluid passages in a manifold block are arranged to heat the block uniformly and dead air spaces in a cap member reduce heat loss.

3,659,351

CLEAN-OUT MEANS FOR GRAIN DRYER

Erhard E. Alms, Barrington, and James E. Mitchell, Cary, both of Ill., assignors to AFE Industries, Inc., Lake Zurich, Ill.

Filed May 4, 1970, Ser. No. 34,027
Int. Cl. F26b *17/12*
U.S. Cl. 34—174 **3 Claims**

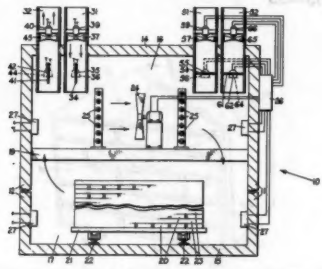


An improved means for cleaning out the grain that makes its way into the plenum chamber of a grain dryer. The hinged or flexible sheets normally used at the bottom of the chamber are held up in closed position by spring-biased clips which, although readily released by hand, nevertheless hold the sheets in such manner that they are able to support the weight of a man walking on the said sheets.

3,659,352
CIRCULATING AIR DRYER

Franklin W. Cook, Portland, Oreg., assignor to F. W. Cook & Associates Inc., Portland, Oreg.

Filed May 18, 1970, Ser. No. 38,451
Int. Cl. F26b 21/06
U.S. Cl. 34—191 9 Claims

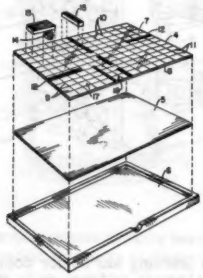


A circulating air dryer including a chamber for holding articles to be dried, and a reversible, power-operated air mover for selectively moving air through the chamber in opposite directions. With the air mover operating in either of opposite directions, the dryer also includes means within the chamber for exhausting a portion of the air circulated upstream from the air mover, means for introducing heat to the air being circulated downstream from where the air is exhausted, and means for introducing make up air into the chamber between the exhaust means and the heating means.

3,659,353
MODULAR LAYOUT METHOD

Rosario D'Agrosa, Dobbs Ferry, N.Y., assignor to J. C. Penny Company, Inc., New York, N.Y.

Filed Apr. 16, 1970, Ser. No. 29,133
Int. Cl. G09b 25/04
U.S. Cl. 35—16 10 Claims

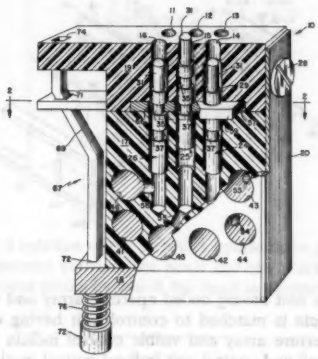


A method and system for planning the layout of commercial space comprising forming a modular layout of the space by selectively arranging a plurality of thin modules representing objects to be placed within the space over a planning surface to which the modules are magnetically attracted, said modules having indicia contrasting with the planning surface and making a clear and distinct shadow free photographic reproduction of the layout at any desired scale.

3,659,354
BRAILLE DISPLAY DEVICE

Norman B. Sutherland, Bedford, Mass., assignor to The Mitre Corporation, Bedford, Mass.

Filed Oct. 21, 1970, Ser. No. 82,564
Int. Cl. G09b 21/00
U.S. Cl. 35—35 A 11 Claims

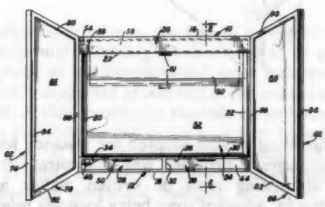


In the Braille display system disclosed herein a plurality of identical cells are arranged in a row and each cell is adapted to display a single Braille character. Each cell employs a plurality of pins which can be selectively raised to projecting positions by pneumatic signals which are common to all of the cells in a given row. Further, each cell includes an electrically actuable interposer member which can be selectively operated to either lock the pins in that cell in their existing positions or to free them and thereby enable them to respond to the common pneumatic signals.

3,659,355
WALL MOUNTED COMBINATION CHALKBOARD, PROJECTOR SCREEN AND INFORMATION DISPLAY APPARATUS

Adelard L. Aubin, Jr., 14 Lakeshore Drive, South Bellingham, Mass.

Filed Nov. 2, 1970, Ser. No. 86,226
Int. Cl. B43l
U.S. Cl. 35—62 11 Claims



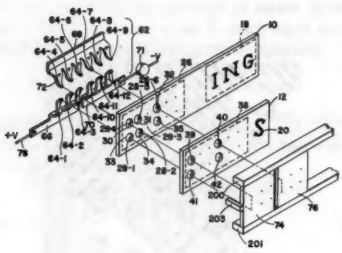
An upright wall supported receptacle having a compound back wall including a chalkboard, an oppositely disposed open front side, a projector screen supported on the receptacle and being selectively movable into and out of confronting juxtaposition relative to the chalkboard, and wing extensions comprising tack boards pivotally connected on the receptacle for swinging movement toward one another to close the open side of the receptacle.

3,659,356

ELEMENT MATCHING DEVICE

Roy A. Nelson, 25 Oakwood Road, Acton, Mass.

Filed June 30, 1970, Ser. No. 51,177
Int. Cl. G09b *5/02*
U.S. Cl. 35—35 D **14 Claims**



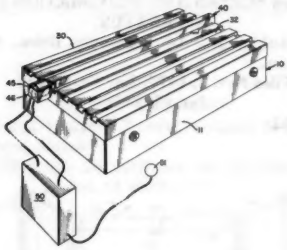
Element unit having coded aperture array and visible element indicia is matched to control unit having compatibly coded aperture array and visible control indicia by placing element unit and control unit in fixed mutual spatial relationship in which apertures of compatibly coded arrays cooperate to form one or more continuous paths for a signal. An indicator is actuated in response to a signal received after traversing continuous paths, and element and control indicia remain visible while units are matched.

3,659,357

AUDIO-VISUAL APPARATUS

Dimitri Martinesco, 51 Residence du Clos, Verrieres-le-Buisson, 91, and Charles L. Marsot, 3 Avenue Foch, Paris, 16, both of France

Filed Dec. 11, 1969, Ser. No. 884,241
Claims priority, application France, Dec. 12, 1968, 177825
Int. Cl. G09b *5/06;* **G11b** *5/00*
U.S. Cl. 35—35 C **5 Claims**



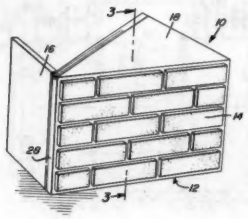
An audio-visual device adapted for instance for teaching foreign languages is provided with a substrate on which is disposed alternating rows of written matter and sound recorded tracks, adjacent rows being logically related to one another, for example, a recorded track may contain a translation of the adjacent written matter. Several embodiments are shown including one in which a sound track reading head disposed in a reading arm is driven along a sound track wherein the reading arm is removed from above one line when it has been read and put into position above the next line. In another embodiment, the substrate is formed as sheets in a loose-leaf binder which are turned after a side has been read and listened to. In a final embodiment, means are provided for automatically displacing the reading arm and the magnetic tape reading head between adjacent lines as well as a drive for returning the magnetic tape reading head to its starting position at a high speed.

3,659,358

BRICK DISPLAY UNIT

Jack S. Brown, P.O. Box 583, Eastland, Tex.

Filed Mar. 24, 1970, Ser. No. 22,257
Int. Cl. G09b *25/00*
U.S. Cl. 35—53 **12 Claims**



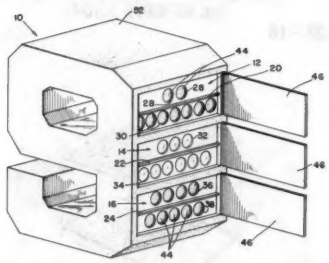
Brick samples are displayed by insertion into recesses of a molded panel, the recesses being separated by mortar simulating surfaces. Side flaps hinged to the panel unfold from the back to support it in an upright position. A roof section is mounted on the top edge of the panel for color comparison purposes.

3,659,359

MULTISENSORY LEARNING AID DEVICE

Priscilla Laubenstein, 15 Half Mile Road, Barrington, R.I.

Filed Nov. 3, 1970, Ser. No. 86,546
Int. Cl. G09b *23/02*
U.S. Cl. 35—70 **10 Claims**



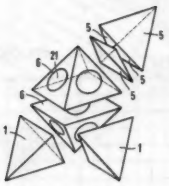
A multisensory learning aid device comprising a series of three-dimensional blocks representing the numerals one through nine and zero, each block having a compartment therein for each combination of numbers that may be added to arrive at the numeral represented by the block, each compartment having a pair of rows of recesses therein with the number of recesses in each row corresponding to the numbers which may be added to arrive at the numeral represented by the block, an article removably positioned in each recess with all of the articles in each block being of the same color and significance but being of a different color and significance from all of the articles in each other block, and closure means for each compartment.

3,659,360

REGULAR AND SEMI-REGULAR POLYHEDRONS CONSTRUCTED FROM POLYHEDRAL COMPONENTS

Walter Zeischegg, Neu-Ulm, Germany, assignor to Hansfriedrich Hefendehl, Lerchenweg, Klerspe, Germany

Filed June 2, 1969, Ser. No. 829,252
Claims priority, application Germany, June 4, 1968, P 17 72 572.3
Int. Cl. A63h *33/14*
U.S. Cl. 35—72 **10 Claims**



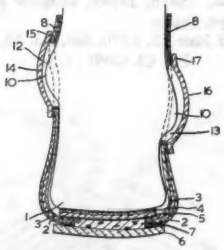
A construction set, for building structures assembled from geometric parts having plane surfaces, comprises a plurality of geometric parts including at least one group of equal pyramids each having three, four, or five equal side faces and at least one part in the form of a semi-regular or regular polyhedron having at least one plane of symmetry. This latter part can be assembled from partial bodies, such as base-abutted pyramids, or may be a single unitary body. Adhesive means are provided to interconnect the geometrical parts selectively in either face-abutting or articulated edge-abutting relation.

3,659,361

SKATE BOOT

Thomas Paul White, Sr., 109 Gilbert Street, Saint John, New Brunswick, Canada

Filed Dec. 19, 1969, Ser. No. 886,704
Int. Cl. A43b *00/00*
U.S. Cl. 36—2.5 AL **6 Claims**



The present invention relates to skate boots and in particular the present invention relates to an improved skate boot in which the high top shoe quarters thereof fit in a snug or glove-like fashion around the ankles of the wearer.

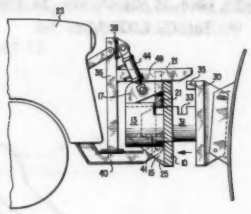
3,659,362

IMPLEMENT HITCH

Charles Gilbert Bell, Sioux City, Iowa, assignor to City of Sioux City, Iowa

Filed May 14, 1970, Ser. No. 37,261
Int. Cl. A01b *51/00*
U.S. Cl. 37—42 R **6 Claims**

A hitch for implements of the pushed type including first and second plates, one mounted on a truck and the other on the implement. The plates are aligned and held together by a peg which protrudes from one plate and through a tube attached to the other. A latch lever holds the peg in the tube. Guide blocks on one plate mate with notches on the other to limit relative rotation of the plates. A hydraulic or pneumatic cylinder operates between the hitch and the truck to move the hitch about pivots by which the hitch is connected to the truck.

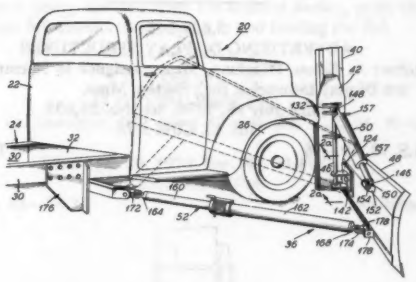


3,659,363

ADJUSTABLE WING PLOW WITH MEANS TO POSITIVELY MAINTAIN ADJUSTMENT

Roderick C. Snyder, Wausau, Wis., assignor to Wausau Iron Works, Wausau, Wis.

Filed June 15, 1970, Ser. No. 46,044
Int. Cl. E01h *5/06*
U.S. Cl. 37—50 **7 Claims**

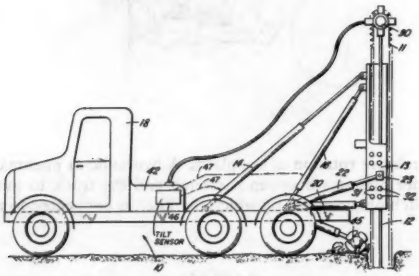


A wing plow attachable to the side of a vehicle such as a truck. A horizontal mounting bar is shaped to fit across the frame, in place of the conventional front bumper. An upstanding post is supported at one end of the post ahead of the front wheels. A slide member is movable up and down on the post, and is movable up and down by a first power cylinder within the post. A pivot member and a hinge member are supported, at upper and lower positions, respectively, on the slide member, for horizontal swinging movement. A plow blade is tiltable up and down on the hinge member. A second power cylinder is connected between the pivot member and the plow blade. A resilient compression member extends between the back of the plow blade and the truck frame. The second power cylinder adjusts the slope angle of the blade and moves the blade between and upper, out-of-the-way position folded against the side of the truck, and a lower operating position. The compression member is variable in length to adjust the sweep angle of the plow blade. The first power cylinder can elevate the plow blade without changing its slope or sweep angles.

3,659,364
TRENCH CUTTER USING ENDLESS CUTTER CHAIN

Leslie Peter Stuart Wilson, Nassau, Bahamas, assignor to Gimda Inc., Nassau, N.P., Bahamas

Filed June 24, 1969, Ser. No. 836,111
Claims priority, application Great Britain, June 25, 1968, 30,276/68; July 25, 1968, 35,671/68; Feb. 24, 1969, 9,830/69
Int. Cl. E02f 5/06
U.S. Cl. 37—83 14 Claims

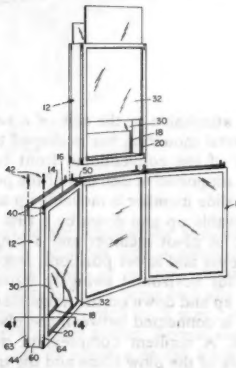


Trench cutting apparatus particularly for cutting deep narrow trenches has a power-driven endless cutter chain on an elongated chain support which is linearly movable in a carrier mounted on a vehicle. In operation the carrier is vertical (or inclined to the vertical if a sloping trench is required) and is held in position by adjustable rams which permit the cutter to be positioned across the width of the vehicle as required and serve to maintain the carrier in the required plane.

3,659,365
ADVERTISING DISPLAY STRUCTURES

Robert A. Eaton, Hingham, Mass., assignor to Norman-Buffett Display Industries, Inc., Boston, Mass.

Filed July 15, 1970, Ser. No. 55,005
Int. Cl. G09f 3/18
U.S. Cl. 40—16 1 Claim

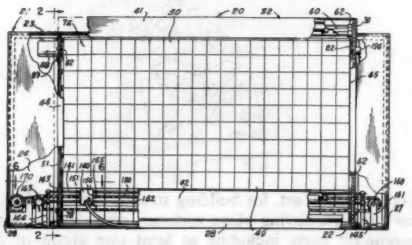


A display structure is made up of a multiplicity of modules in the form of rigid plastic foam frames which are grooved and slotted to receive one or more interchangeable display panels so that the frames of the module are reusable with different panels.

3,659,366
DISPLAY APPARATUS

Robert L. Woolfolk, Dallas, Tex., assignor to Dow Jones & Company, Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 645,022, June 9, 1967, now Patent No. 3,487,568. This application Jan. 5, 1970, Ser. No. 674
Int. Cl. G09f 11/12
U.S. Cl. 40—28 C 17 Claims

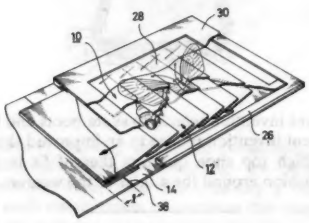


Display apparatus for presenting data in visual form having panels provided with passages in which display elements, such as balls, are movably positioned and means for selectively moving the balls in their passages between their operative visible positions and their inoperative positions to cause the balls to form or delinate characters. The display apparatus may include a plurality of such panels connected in an endless belt and movable before an opening or window so that the data on more than one panel may be visible at a single time. The means for moving the balls may be jets of air delivered by nozzles mounted on a carriage movable relative to a panel when it is in a predetermined position.

3,659,367
FEATURE VARIABLE PICTURE AND BOOK

Hirokazu Yumoto, Tokyo, Japan, assignor to Sumida Shiko Co., Ltd., Tokyo, Japan

Filed June 15, 1970, Ser. No. 46,161
Int. Cl. G09f 11/30
U.S. Cl. 40—65 4 Claims



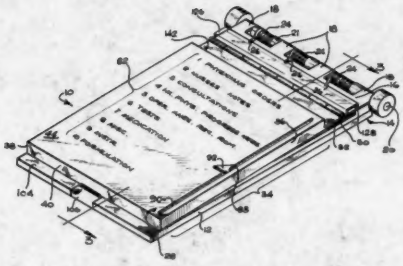
A feature variable picture embodying a stationary picture assembly and a sliding picture assembly of different feature from the stationary picture assembly which are slideably incorporated one another to present two different features of picture alternately.

3,659,368

CHART HOLDER

Isabella J. Colbert, 425 West 63rd St., Los Angeles, Calif.

Filed Aug. 29, 1969, Ser. No. 854,211
Int. Cl. G09f 11/06
U.S. Cl. 40—104.01 6 Claims



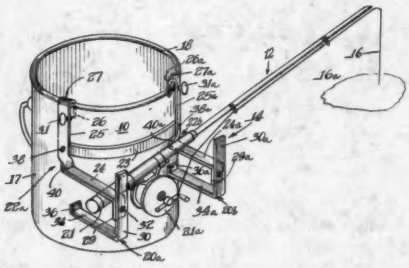
An index charge holder in which a plurality of indexed cards are clamped to a supporting base and a cover is provided pivotally connected to the clamping means. The cards have keyed cutaway edges and a slider is disposed on the cover having an inwardly extending portion beneath the cover adapted for selective coaction with the cutaway card edges, so that when the cover is raised, a selected quantity of the cards are lifted therewith. The upper portions of the cards are secured to the base independent of the clamping means and a plurality of sheets are disposed between the indexed cards secured by the clamping means, but otherwise unsecured so that they may be removed upon opening of the clamping means. The cover is formed to pivotally swing onto the clamping means for levered opening thereof.

3,659,369

FISH POLE HOLDER

Everet T. Hermanson, 2318 Mannheim Rd., Melrose Park, Ill.

Filed Dec. 17, 1969, Ser. No. 885,903
Int. Cl. A01k 97/10
U.S. Cl. 43—21.2 8 Claims



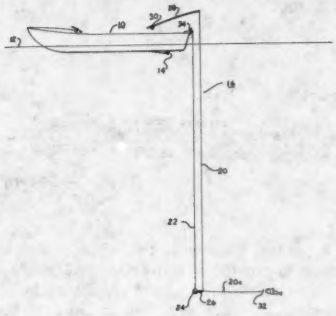
A device for supporting a fishing rod in an inclined position alongside a container such as a minnow container or the like. The device comprises a frame engaging the container wall and a pair of bracket arms secured to and extending outwardly from the frame providing support means for the rod. The bracket arms are laterally spaced from each other and include a lower support member for accommodating the portion of the rod rearwardly of the reel and an upper support member for accommodating the portion of the rod forwardly of the reel.

3,659,370

TROLLING DEVICE AND SYSTEM

Charles P. Ritter, 704 E. Prairie Ronde, Dowagiac, Mich.

Filed Sept. 10, 1969, Ser. No. 856,554
Int. Cl. A01k 91/00, 95/00
U.S. Cl. 43—43.12 5 Claims



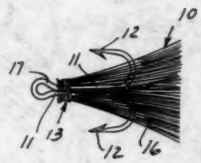
A trolling system in which a weight suspended by a line is used to hold a fishing line at the desired depth in the water. A control device releasably connects the fishing line to the weight line and includes a pair of jaws and means for varying the spacing of the jaws to vary the force required to disengage the line from the jaws when a fish is caught. The fishing line, upon being released from the control device, gives the fisherman full control over reeling in and landing the fish.

3,659,371

FLY TYING PROCESS

Wayne O. Duescher, 951 West County Rd. C-2, St. Paul, Minn.

Filed Apr. 29, 1970, Ser. No. 32,862
Int. Cl. A01k 85/08
U.S. Cl. 43—42.25 9 Claims



A fly tying process in which hairs or fibers are precut to length and a bundle or bundles of hair are placed uniformly about and along the shank of a fishhook or lure. The bundle of hair and shank are encompassed by two continuous adjacent loops with a slip knot connecting an inner loop to an outer loop and an outer slip knot in the outer loop having free ends extending in opposite directions from the shank. Where the loops are formed from wire, the knots will not hold until reduced to a small diameter and deformed past the yield point of the wire. The reduction in size of the loops by drawing on the free ends of the wire, produces a rotating motion of the hair relative to the shank which uniformly spreads

the hair before flaring of the hair as the wire is finally tightened. The wire loop is then covered with epoxy cement or plastic. The hair may be animal hair or synthetic fibers. As an alternate form of the disclosure, the loops are formed from thread and a split metal ring is crimped to the thread to hold the thread to the hair and shank.

3,659,372

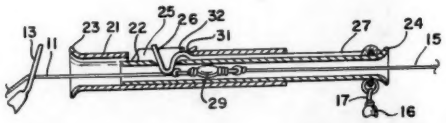
SINKER RELEASE METHOD AND APPARATUS

Robert E. Cullen, 15806 Presswick Lane, Bowie, Md.

Filed Jan. 29, 1971, Ser. No. 111,056

Int. Cl. A01k *95/00*

U.S. Cl. 43—44.88 **13 Claims**



A fishing apparatus attachable to and moveable along a fishing line so as to provide a recoverable sinker release that is operative when retrieving a catch. A fishing line with a swivel connecting a leader and bait or lure is threaded through two concentric, interlocking, cylindrically shaped members, the inner one of which is provided with an attaching means for carrying various sized sinkers. The concentric members are locked together in use by a spring extending through an opening in the inner member to rest against said swivel. As a catch is retrieved, the outer concentric member contacts the tip of a fishing rod or pole and disengages said spring from contact with the swivel, thereby permitting said catch to be retrieved.

3,659,373

RECEPTACLE FOR INSECTICIDE PLATE

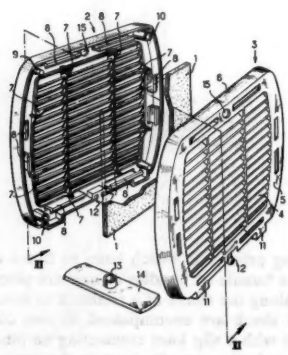
Jean Daeninckx, Saint-Denis, France, assignor to Societe anonyme dite: LOreal

Filed Feb. 4, 1970, Ser. No. 8,515

Claims priority, application France, Feb. 5, 1969, 6902574

Int. Cl. A01m *13/00*

U.S. Cl. 43—125 **5 Claims**



The receptacle includes two identical covers provided with grilles for circulation of air and snaps for holding the two covers together with the insecticide plate enclosed between them and held spaced from the grilles by spacer elements formed on the insides of the covers.

3,659,374

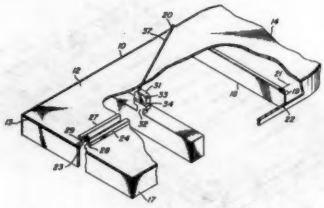
INSECT CATCHER ASSEMBLY

Leon F. Steves, 1181 Mead Lane, Flagstaff, Ariz.

Filed Jan. 11, 1971, Ser. No. 105,362

Int. Cl. A01m *3/00*

U.S. Cl. 43—134 **3 Claims**



A hand-held insect catcher assembly for entrapping and dispatching an insect located upon a surface. The assembly has a box-like trap which is open on the underside and an elongate handle extending rearwardly therefrom. When the assembly is positioned over an insect, and upon striking the surface, a bias loaded slide bar within the trap is triggered and released to travel rearwardly to dispatch the insect and deposit same into the hollow handle. An end cap on the handle facilitates removal of the collected insects.

3,659,375

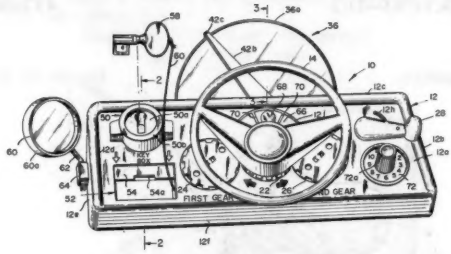
TOY WITH PSEUDO AUTOMOBILE CONTROLS AND PSEUDO AUTOMOBILE WINDSHIELD AND WINDSHIELD WIPER MECHANISM

Albert Stubbmann, Franklin Lakes, N.J., assignor to Kohner Bros., Inc., East Paterson, N.J.

Filed May 4, 1970, Ser. No. 34,066

Int. Cl. A63h *33/00*

U.S. Cl. 46—1 B **11 Claims**

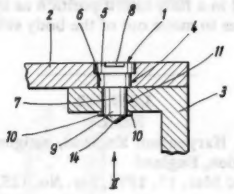


A toy which enables a child to simulate to some extend the motions required in driving an automobile. The toy includes a frame and a number of parts in operative relation therewith, the parts simulating some of the controls of an automobile and an automobile windshield and windshield wiper. One of the parts is a lever that is pivotally fixed to the frame and which simulates the automobile transmission shift lever. A plastic shield which simulates the automobile windshield is fixed to the frame and a pair of arms that simulate a windshield wiper flank both sides of the plastic shield. A kinematic linkage connects the lever and arms so that manipulation of the lever results in the arms sweeping across the opposite sides of the plastic shield to simulate the action of a windshield wiper.

3,659,376
CONNECTING ARRANGEMENT FOR USE IN A TOY ASSEMBLY KIT

Artur Fischer, Altheimer Str. 219, Tumlingen, Germany

Filed May 4, 1970, Ser. No. 34,474
Claims priority, application Germany, May 30, 1969, P 19 27 626.7; June 24, 1969, G 69 24 984.9; June 28, 1969, G 69 25 750; Oct. 22, 1969, G 69 41 000.0
Int. Cl. A63h *33/10*
U.S. Cl. 46—31 12 Claims

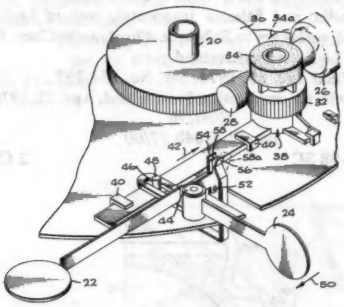


In a toy assembly kit two elements are to be connected with one another. They are superimposed and have juxtaposed first surfaces and second surfaces which face away from one another. Registering apertures are provided in both elements. An elongated connecting member extends through both of the apertures and is turnable therein. It has a head portion which engages the second surface of one of elements and a free end portion provided with projections which are receivable in response to turning of the connecting member in corresponding recesses provided in the inner circumferential surface of the aperture in the other element or in the second surface of the other element. Thereby, the elements are connected against separation but can be turned with reference to one another.

3,659,377
CHECKOUT STAND TOY WITH TURNTABLE DRIVE

Larry D. Workman, Fountain Valley; Ralph R. Laing, Hermosa Beach; J. Stephen Lewis, Pacific Palisades, and Emil H. VonWinckelmann, Van Nuys, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Apr. 1, 1970, Ser. No. 130,388
Int. Cl. A63h *33/30*
U.S. Cl. 46—40 9 Claims

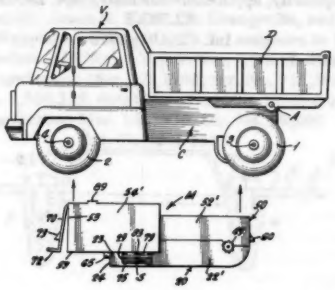


A toy supermarket checkout stand with a rotatable turntable for holding goods and a constantly rotating sign over it, which uses a simple self-disengaging drive for the turntable. A drive roller for rotating the turntable, is fixed to a worm wheel that is rotated by a screw. The worm wheel is mounted on a frame that slides parallel to the axis of the screw so that the worm wheel is always engaged with the screw, the frame sliding between an engaged position wherein the drive roller engages the turntable and a disengaged position wherein it is disengaged from the turntable. The motor rotates the screw in a direction that urges the frame towards the disengaged position, so that there is automatic disengagement without the use of a spring, whenever a child is not pushing the frame towards the engaged position.

3,659,378
MOTOR DRIVEN TOY VEHICLES

Duncan Tong, No. 23 C Robinson Road, Victoria, Hong Kong

Filed Jan. 23, 1970, Ser. No. 5,308
Int. Cl. A63h *33/26*
U.S. Cl. 46—244 R 20 Claims

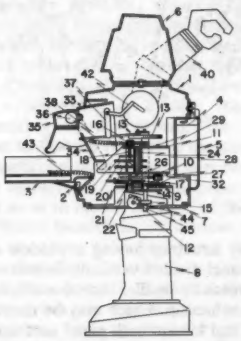


Motor driven toy vehicles which may assume the form of different vehicle bodies, each having a chassis with a baseplate at the bottom thereof provided with a generally rectangular opening into which may be inserted different and interchangeable module casings containing drive mechanisms for the vehicles. These mechanisms may assume different forms although they are composed essentially of a small direct-current motor, a dry cell for energizing the motor and a switch mechanism for controlling the connections therebetween. One embodiment of module makes possible the movement of the vehicle in forward and backward directions from a position of rest. Another embodiment permits energization of the motor in a single direction only which compels movement of the vehicle in diverse and haphazard directions by combining the steering control for the vehicle with the traction drive therefor.

3,659,379
TOY ROBOTS

Kataro Suda, No. 41-1, 4-chome Higashi-Mukojima, Sumida-ku, Tokyo, Japan

Filed Mar. 30, 1970, Ser. No. 23,923
Int. Cl. A63H *33/26*
U.S. Cl. 46—247 6 Claims



Improvements of toy robots characterized in that the torso of a robot is swung left and right alternatively with suitable

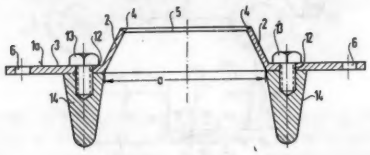
time intervals and angles maintained and, at the same time, both arms are moved up and down at a suitable angle of inclination with respect to each other.

3,659,380

PLATE FOR CONTROLLING THE FILLING DENSITY IN PLANT CONTAINERS BEFORE OR DURING AN AUTOMATIC MAKING OF HOLES FOR PLANTS IN THE FILLING COMPOUND

Georg Mayer, Bolheim, Germany, assignor to Firma Mayer KG, Heidenheim-Mergelstetten, Germany

Filed Sept. 19, 1969, Ser. No. 859,538
Claims priority, application Germany, Sept. 20, 1968, P 17 82 587.5
Int. Cl. A01g *9/08*
U.S. Cl. 47—1 **4 Claims**



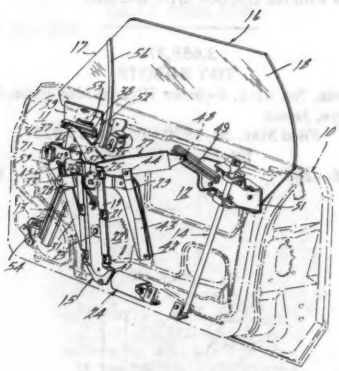
A plate having an upwardly projecting offset for shaping soil inserted into a plant-receiving pot. The plate stacks the soil around the plant-receiving opening to make same available for filling same.

3,659,381

VENT WINDOW SYSTEM FOR VEHICLE BODY STRUCTURE

Stuart M. Frey, Birmingham; Harold C. Gebhard, Livonia, and Julius Rado, Birmingham, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sept. 25, 1970, Ser. No. 75,392
Int. Cl. E05f *5/10*
U.S. Cl. 49—103 **16 Claims**



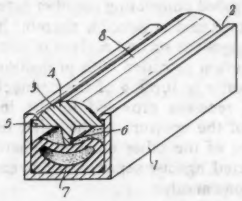
A vehicle body structure having a window opening fitted with a window panel divided vertically into two sections, one of which is substantially smaller than the other. A single window regulator mechanism, which may be manually or power operated, raises and lowers both panel sections in controlled sequence. With the window panel in raised condition, actuation of the window regulator mechanism results in the smaller panel section being lowered into the body structure to provide a ventilation exhaust opening. During the travel of the smaller panel section into the body structure, the larger panel section remains locked in a fully raised position by a latch mechanism that is a component of the window regulator mechanism. When the smaller panel section reaches a predetermined down position, the latch mechanism is released allowing the larger panel section to travel to a full down position. Upon movement of the window panel section from its lowered position to a raised position, a reverse sequence occurs during which the larger panel section again becomes locked in a fully raised position as the smaller panel section continues to move out of the body structure into fully raised position.

3,659,382

SEALS

Bernard Dixon, Harpenden, England, assignor to Sealmaster Limited, London, England

Filed Mar. 17, 1971, Ser. No. 125,347
Claims priority, application Great Britain, June 16, 1967, 27,950/67
Int. Cl. E06b *7/16*
U.S. Cl. 49—481 **6 Claims**



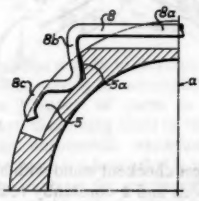
A door seal having a channel-shaped rigid member in which is contained a sealing member. A resilient member is located between the sealing member and the channel member and a longitudinal ridge, which forms part of either the sealing member of the channel member, is arranged so as to deform the resilient member when the sealing member is depressed in use.

3,659,383

WRIST WATCH STRAP CONNECTIONS

Gerard Cachelin, and Etienne Jeannottat, both of Le Locle, Switzerland, assignors to Fabrique d'horlogerie Chas. Tissot & Fils SA, Le Locle, Switzerland

Filed Apr. 15, 1971, Ser. No. 134,257
Claims priority, application Switzerland, Apr. 22, 1970, 5991/70
Int. Cl. G04b *37/00*
U.S. Cl. 58—88 SC **2 Claims**



A wristwatch case has a side wall over which an outer ring is removably engaged and held by two spring members each having a middle part forming a bracelet loop and curved extremities engaging in facing grooves of the case and wall. An outer terminal part of each extremity normally engages in the groove of the ring but, for fitting or removal of the ring, can

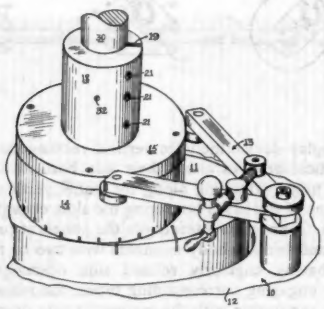
be compressed into a groove of the case by an inclined surface on the ring.

3,659,384

MACHINE FOR PARALLELLY LAPPING OPPOSITE SURFACES OF A WORKPIECE

Lawrence Day, Chicago, Ill., assignor to Spitfire Tool & Machine Co., Inc., Chicago, Ill.

Filed Mar. 16, 1970, Ser. No. 19,967
Int. Cl. B24b *37/00*
U.S. Cl. 51—131 **2 Claims**



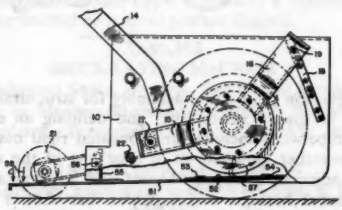
An improvement in a machine for parallelly lapping opposite surfaces of a workpiece by a rotatable lapping plate on which the work is positioned within a base or workholding ring beneath a pressure plate keyed to the ring for rotation therewith about a fixed vertical axis common to both the ring and the pressure plate and with the pressure plate self-adjustable vertically relative to such axis by engagement of the pressure plate with the work being lapped.

3,659,385

DETACHABLE SHARPENER FOR A CROSS-FLOW MOWER

Hugo S. Ferguson, Averill Park, N.Y., assignor to Reel Vortex, Inc., Poestenkill, N.Y.

Filed May 15, 1970, Ser. No. 37,774
Int. Cl. B24b *19/00*; A01d *75/08*
U.S. Cl. 51—250 **6 Claims**



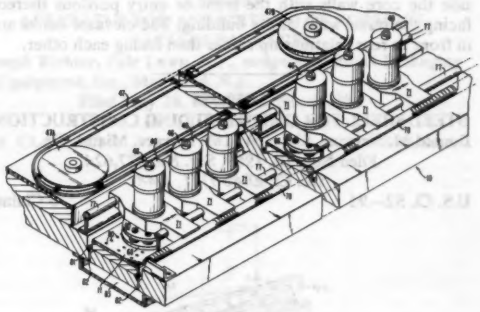
The sharpener comprises a treadle having a front section of stiffly flexible material with an abrasive surface on the upper side thereof adapted to extend across the width of the reel of the mower. The treadle is hingeably attached to the mower intermediate the front and rear ends of the treadle with the front section extending beneath the mower reel and the rear section accessible for foot operation. By starting the mower engine and exerting pressure on the rear section of the treadle, the front section sharpens the reel. Advantageously a unitary sheet of stiffly flexible material is employed so that by moving the foot along the rear section different sections of the reel are sharpened.

3,659,386

A METHOD FOR PROVIDING A FINISHED SURFACE ON WORKPIECES

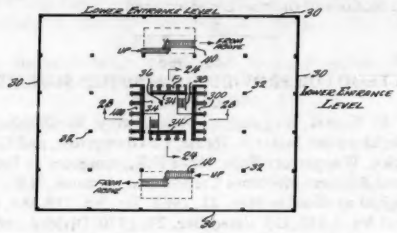
Fred E. Goetz, Wappingers Falls; Perry R. Druzba, Jr., Poughkeepsie; James R. Hause, La Grangeville, and Gerard Seeley, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Original application Mar. 22, 1968, Ser. No. 715,350, now Patent No. 3,550,325, dated Dec. 29, 1970. Divided and this application Mar. 16, 1970, Ser. No. 20,006
Int. Cl. B24b *1/00*
U.S. Cl. 51—318 **3 Claims**



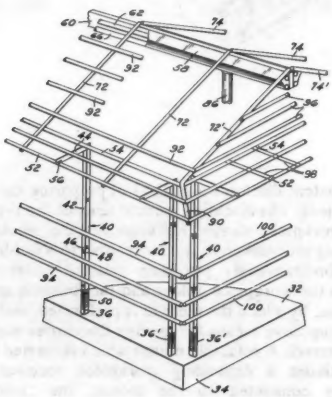
This patent discloses a method of preparing the surface of a workpiece. The disclosed method teaches the provision of a novel workpiece carrier for engaging the workpiece, and oscillating the workpiece holder relative to a finishing surface while simultaneously providing relative linear movement between the workpiece holder and the finishing surface. The apparatus, by which the method is performed, includes a carrier having drive means for moving the carrier along a linear path of travel. A rotatable mount which is carried by the carrier includes a depending workpiece receiver which is rotatably connected to the mount, the receiver being mounted eccentrically with respect to the carrier. Means are provided for imparting rotation to the mount and separate means such as springs are connected between the receiver and the carrier so as to inhibit rotation of the receiver while permitting oscillation thereof. In this manner, an article being held by the receiver may be engaged and oscillated against the finishing surface in substantially coplanar relationship therewith. In addition, as herein disclosed, the finishing table upon which the carriers ride may be provided with a plurality of finishing surfaces, each adapted for different finishing operations with intermediate cleaning surfaces to clean the workpiece of any residue adhering thereto from a previous finishing surface.

3,659,387
BUILDING STRUCTURE WITH ELEVATORS
Clyde C. Pearson, Jr., 503 Collier Rd., N.W., Atlanta, Ga.
Filed Apr. 6, 1970, Ser. No. 26,031
Int. Cl. B66b 9/00
U.S. Cl. 52—30 3 Claims



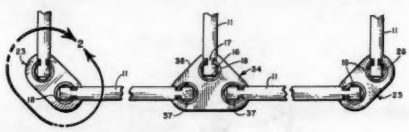
A building structure is described in which the core walls are used as principally horizontal load bearing structures, said walls being capable of receiving and transferring to the ground substantially horizontal forces from any direction. The service elements on each level are placed so that they are directly above the service elements on preceding levels. Banks of elevators serving the various levels are placed outside the core walls with the front or entry portions thereof facing the outer walls of the building. The elevator banks are in front to rear relationship rather than facing each other.

3,659,388
STEEL SHELL FOR USE IN BUILDING CONSTRUCTION
Donald M. Sirianni, 530 N.W. 189 Terrace, Miami, Fla.
Filed Nov. 18, 1969, Ser. No. 877,624
Int. Cl. E04b 1/41, 1/48
U.S. Cl. 52—91 6 Claims



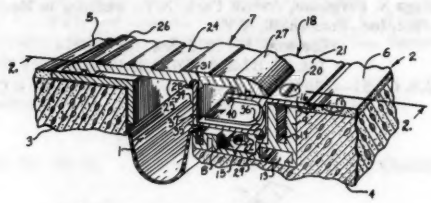
A metal frame is provided for reinforcing a unitary concrete building having side and end walls and a gabled roof. Wall studs and a center ridge beam are first erected. The studs and beam are initially plumbed to be sure they are in proper vertical alignment. Then, roof joists are extended between the beam and the studs without disturbing alignment of the studs. A latticework is provided around the entire frame structure for supporting concrete. The interior of the frame is surfaced with a concrete supporting lath-like layer and then concrete is sprayed onto both the interior and exterior surfaces of the frame to complete a building construction.

3,659,389
DISPLAY DEVICE
Charles Forberg, 115 State Street, Brooklyn, N.Y.
Filed Apr. 24, 1970, Ser. No. 31,545
Int. Cl. E04b 1/40, 2/74
U.S. Cl. 52—285 9 Claims



A display device includes vertical rectangular panels having vertical grooves along their side borders and vertically slotted tubes extending along the panel vertical edges with the edges of the tubes bordering the slots engaging the panel grooves. Connectors intercouple the panels at predetermined angles and include body members with two or more vertical bores having angularly related side openings, the bores snuggly engaging corresponding tubes, the respective panels borders registering with the connector side openings. A plurality of vertically spaced connectors may intercouple adjacent panels and the lower and upper connectors may be elongated and project below and above the panels to function as legs and connectors between upper and lower panels respectively.

3,659,390
EXPANSION JOINT COVER ASSEMBLY
Claude P. Balzer; Edward M. Corman; Almer A. Reiff, and Wilber E. Kirkwood, all of Wichita, Kans., assignors to Balco, Inc., Wichita, Kans.
Filed Nov. 2, 1970, Ser. No. 85,899
Int. Cl. E04b 1/68; E01c 11/02
U.S. Cl. 52—464 14 Claims



An expansion joint cover assembly for structural sections disposed in spaced relationship and defining an elongated joint therebetween includes an elongated rigid base and/or support member mounted on at least one of the structural sections adjacent a margin thereof and an elongated rigid plate member having a width greater than that of the joint between the structural sections and positioned to overlie same. The expansion joint cover assembly includes a member hingedly connecting the plate member and base and/or support member to permit relative movement therebetween and spaced resilient members engaging the connecting and the support member to hold the plate member in position overlying the joint during the relative movement between the plate member and the base and/or support member.

ERRATUM

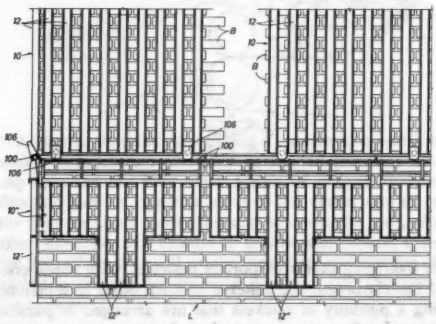
For Class 52—537 see:
Patent No. 3,660,482

3,659,391

METHOD OF AND MEANS FOR CONSTRUCTING AND ERECTING BUILDING STRUCTURES FORMED OF BRICKS, OR THE LIKE

Roy A. Nichols, Route 5, Box 1070, Benton, Ark.

Continuation-in-part of application Ser. No. 646,831, June 19, 1967, now Patent No. 3,503,174. This application Mar. 24, 1970, Ser. No. 22,330
Int. Cl. E04g *21/16*
U.S. Cl. 52—747 **5 Claims**



A method of and means for constructing and erecting building structures formed of block-like elements, such as bricks in which the elements are formed into assemblies or sections made up of a plurality of courses cemented together with the end elements of alternate ones of the courses along one side of the assembly extending beyond the ends of the elements of the others of the courses, and the end elements of the other courses along the opposite side of the assembly extending beyond the ends of the end elements of said alternate courses along said opposite side. The method includes the positioning of the assemblies so formed in upright positions for movement toward each other to extend the end elements of the alternate courses of one assembly between the end elements of the other courses of another assembly to permit the joining of the assemblies to complete a building structure. The method also includes the positioning of additional assemblies above a lower portion of a building structure made in accordance with the method of the invention, and supporting such additional assemblies on such lower portion and joining the additional assemblies to form upper portion of the building structure. The invention includes apparatus for holding the assemblies one on top of another in vertically spaced relation for the introduction of mortar therebetween whereby an upper portion of a building structure may be erected on a lower portion thereof.

3,659,392

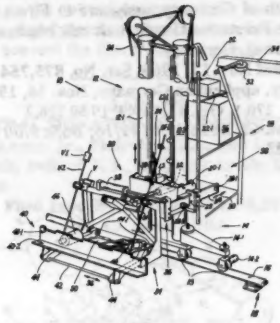
BRICK-LAYING MACHINE

Andries Johannes Stoltz, Pretoria, Republic of South Africa, assignor to Monres (Proprietary) Limited, Braamfontein, Johannesburg, Transvaal Province, Republic of South Africa

Filed Sept. 3, 1970, Ser. No. 69,290
Claims priority, application South Africa, Sept. 9, 1969, 69/6412
Int. Cl. E04g *21/22*
U.S. Cl. 52—749 **8 Claims**

A method of building in which a number of bricks are laid simultaneously in a single course on a previously laid layer of mortar. The bricks may be vibrated to bed them down onto the motor.

A machine having a clamp head adapted to receive a number of bricks in series and to clamp them. The clamp head has a pair of intersecting alignment faces against which the bricks are aligned before being clamped. The clamp head



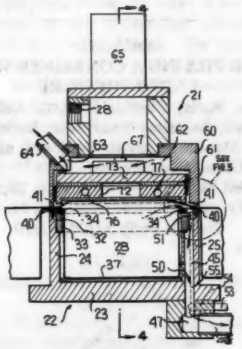
is displaceable from a loading position to an unloading or brick laying position. The clamp head also has a vibrator for bedding the bricks onto a layer of mortar by vibration.

3,659,393

APPARATUS FOR AND METHOD OF FORMING VACUUM PACKAGES

Joseph Richter, Fair Lawn, N.J., assignor to Royal Packaging Equipment, Inc., Maywood, N.J.

Filed May 28, 1970, Ser. No. 41,304
Int. Cl. B65b *31/02*
U.S. Cl. 53—22 A **19 Claims**



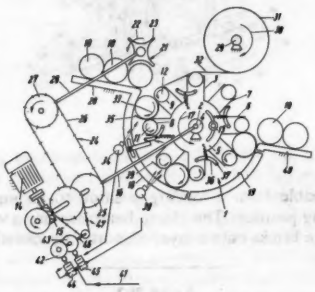
This disclosure relates to apparatus for forming vacuum packages and includes means defining a cavity adapted to receive a package having aperture means in a periphery thereof, means for temporarily sealing a flexible cover to the package periphery outboard of the aperture means, vacuum means for drawing a portion of the flexible cover overlying the aperture means away from the aperture means to form an access opening opening into the package between the flexible cover and the package periphery, means for withdrawing air from the package through the access opening and the aperture means incident to permanently sealing the flexible cover to the package periphery, and means for permanently sealing the flexible cover to the package periphery inboard of the aperture means.

3,659,394

METHOD OF AND MACHINES FOR WRAPPING ARTICLES

Franz Hartleib, Furstenau, and Herbert Windelbandt, Aachen, both of Germany, assignors to Firma Maschinenbau Aachen-Furstenau Gesellschaft mit beschranketer Haftung, Reichsweg, Germany

Filed Nov. 12, 1969, Ser. No. 875,754
Claims priority, application Germany, Nov. 16, 1968, P 18 09 270.1; Oct. 4, 1969, P 19 50 226.2
Int. Cl. B65b *11/0*, *49/16*; B65c *9/00*
U.S. Cl. 53—33 **31 Claims**



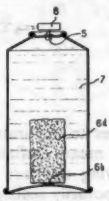
A method and machine for wrapping articles with sheet material involves withdrawing the sheet material from a supply reel and leading it into engagement with the article and thereafter setting the article into rotation so as to entrain the sheet material and wrap the material about the article. The method and machine is useful for packaging and labelling articles.

3,659,395

METHOD FOR FILLING A CONTAINER WITH A FLUID UNDER PRESSURE

Bruno Morane, Paris; Charles Paoletti, Aulnay Sous Bois; Louis Merrien, Fontenay Sous Bois; Robert Sathicq, Villepinte, and Manlio Maurelli, Vaujours, all of France, assignors to L'Oreal, Paris, France

Filed Mar. 17, 1970, Ser. No. 20,214
Claims priority, application France, Dec. 31, 1969, 6945717
Int. Cl. B65b *31/04*, *31/10*
U.S. Cl. 53—36 **9 Claims**



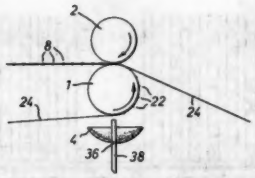
Method and apparatus for storing and dispensing a fluid under pressure which utilizes a container holding a mass of closed-cell foam material. The fluid to be dispensed is introduced under pressure, thereby compressing the foam material, which expands to expel the fluid when a dispensing valve is opened. The foam material may be impregnated with a propellant gas before the fluid to be dispensed is introduced, and in that case the pressure applied when the liquid to be dispensed is introduced may liquefy the propellant gas trapped in the cells of the foam material.

3,659,396

SEED SHEETS

Eric William Baker, Bourne Hill Nursery, Worthing Road, Horsham, Sussex, England

Filed May 4, 1970, Ser. No. 34,427
Int. Cl. B65b *9/02*
U.S. Cl. 53—180 **3 Claims**



Two overlying sheets of porous material, with seeds contained therebetween, are adhered to each other in a manner defining a plurality of pockets that are arranged in parallel equi-spaced columns and rows, there being at least one seed in each pocket.

The seed sheets are made by causing the seeds to be held in a plurality of positions defining equi-spaced parallel rows and columns on a surface of a first one of said sheets, covering the seeds with the second one of said sheets, and adhering the sheets to each other around said plurality of positions whereby to form said pockets. The seeds may be held against the first sheet by suction. The sheets may be caused to adhere together by passing them between rollers that press the sheets together at locations where they are intended to adhere to each other.

An apparatus for making these seed sheets comprises a rotatable suction drum that is provided in its surface with a plurality of perforations arranged in equi-spaced parallel rows and columns, the drum being positioned above a tray for the seeds. A line of spaced-apart rods, that are vertically reciprocable in unison, extend upwardly through the seed tray. The movement of the rods is so synchronized with the rotation of the perforated drum that when the rods reach the limit of their upward stroke, each rod will have its upper end aligned with, and in close proximity to, an associated one of the perforations of a column in said drum, there being one rod for each of the perforations in a column.

Parallel with the perforated drum is a shaft carrying a plurality of rotatable rollers, there being one roller for each of the rows of perforations in the drum. The rollers define with said drum a plurality of nips in the region of the rows of perforations.

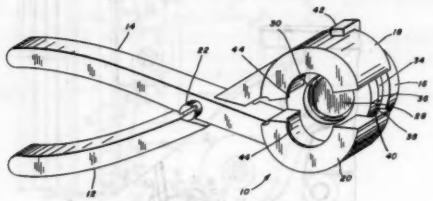
In operation seeds are poured into the tray, and the first sheet of porous material is fed from a first supply source to the underface of the suction drum and thence around the drum to pass between the drum and the plurality of rotatable rollers. The second sheet of porous material is fed from a second supply source to the nip between the rollers and the drum. The reciprocating rods at their lowermost setting dip below the level of the upper surface of the seeds in the tray. On their upward stroke, each of the rods lift one or more seeds from the tray and presents said seed or seeds to the first porous sheet where they are held by the suction in the drum. As the drum rotates the seeds on the first sheet are eventually covered by the second sheet, the two sheets being bonded together around the seeds by the pressure between the nip rollers and the drum.

3,659,397

HAND CRIMPER

James B. Mills, Richmond, Ind., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 30, 1970, Ser. No. 33,221
Int. Cl. B65b *7/28, 67/00*
U.S. Cl. 53—329 **3 Claims**



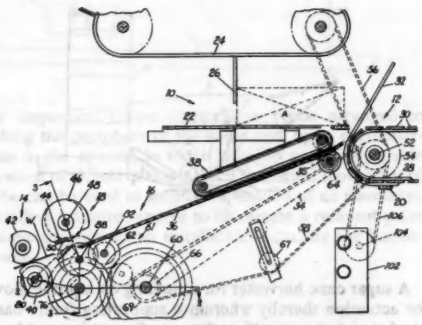
A tool is provided for affixing a closure to a bottle mouth which includes two pivotably connected jaws and a center cap between the jaws, with a pair of integral downwardly directed ears on opposite sides of the center cap to engage the jaws and hold the center cap between the jaws, whereby after affixation of a closure to a container mouth, spreading the jaws of the tool will center the center cap and the closure seated in the cap between the jaws and strip the jaws from the closure.

3,659,398

FILM FEED AND CUTTER FOR FOLD-OVER WRAPPING MACHINE

Ronald Holt, Battle Creek, Mich., assignor to Battle Creek Packaging Machines, Inc., Battle Creek, Mich.

Filed Nov. 2, 1970, Ser. No. 86,075
Int. Cl. B65b *41/12*
U.S. Cl. 53—389 **10 Claims**



A wrapping machine has an article feeding conveyor delivering to a wrapping conveyor driven at the same speed and having a fold-over bar arranged to fold the trailing end of a wrapper sheet forwardly over the article as the article continues to advance. A film feed conveyor delivers the leading end of a wrapper film to the inlet end of the wrapper conveyor to be trapped under and advanced with the article. A rotary cutter bar located at the inlet end of the film feeding conveyor cuts an individual wrapper from the film as the leading end of the wrapper is trapped by the article. Drive connections to the film feed wrapper and the cutter bar and continuously operating film feed rollers operate the film feed and cutter at a slow speed approximating the lineal speed of the wrapping conveyor while the cutter is operating and then speed up the film feed to a fast speed to advance a sufficient length of the film to provide a complete wrapper before the next actuation of the cutter bar.

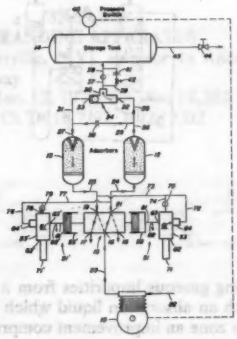
The drive to the cutter bar operates the bar at a peripheral speed that is slightly greater than the slow lineal speed of the film feed to prevent the film from piling up behind the cutter.

3,659,399

FRACTIONATION BY ADSORPTION

George C. Kauer, Jr., Plainview, L.I., and Louis E. Brooks, Great Neck, both of N.Y., assignors to Air Techniques Incorporated

Filed June 29, 1970, Ser. No. 50,392
Int. Cl. B01d *53/04*
U.S. Cl. 55—33 **12 Claims**



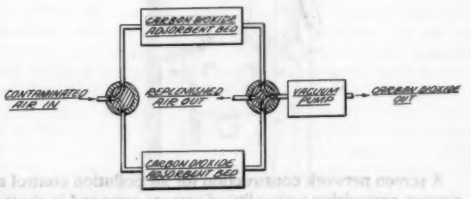
Duel adsorption tower fractionation of a compressed gaseous mixture; in particular dehydration of air, wherein one tower effects adsorption while the other tower is regenerated by a minor portion of the unabsorbed gas while the major portion is passed to a storage tank. The compressor is activated and deactivated in response to predetermined minimum and maximum pressures, respectively, in the storage tank, and the flow path is changed in response to deactivation of the compressor, whereby upon reactivation of the compressor, the functions effected in the towers are reversed. In a preferred embodiment, the flow path is controlled by a pilot operated valve which is pneumatically operated to change the flow paths.

3,659,400

CARBON DIOXIDE REMOVAL FROM BREATHABLE ATMOSPHERES

Frank L. Kester, West Granby, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

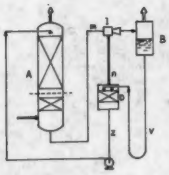
Filed July 21, 1970, Ser. No. 56,794
Int. Cl. B01d *53/02*
U.S. Cl. 55—33 **1 Claim**



In the purification of breathable atmospheres, carbon dioxide is selectively removed therefrom and concentrated in a

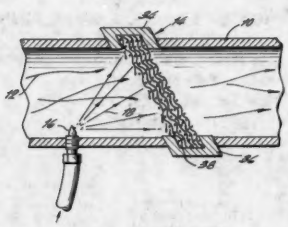
process wherein the contaminated gas stream is passed through a porous bed comprising beads of a solid porous polymer of divinylbenzene coated with polyethylenimine wherein the carbon dioxide is sorbed, the carbon dioxide subsequently being removed from the bed by vacuum desorption at low temperature in a bed regeneration sequence.

3,659,401
GAS PURIFICATION PROCESS
Giuseppe Giammarco, Venice, Italy, assignor to Vetrocoke Cokapuania S.p.A., Venezia Porto Marghera, Italy
Filed Oct. 13, 1969, Ser. No. 865,849
Claims priority, application Italy, Oct. 12, 1968, 53475-A
Int. Cl. B01d *19/00*
U.S. Cl. 55—43 **9 Claims**



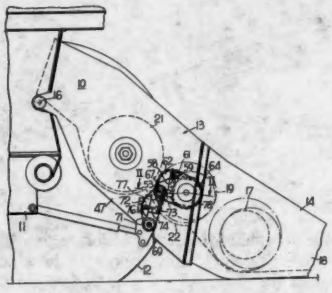
In removing gaseous impurities from a gas mixture under pressure with an absorption liquid which is regenerated in a low pressure zone an improvement comprises taking used absorption liquid from the pressurized absorption zone, expanding it in an ejector whereby a sub-atmospheric pressure is created, freeing contained gaseous impurities. Separation of gaseous impurities and liquid occurs, and separated liquid is subjected to the subatmospheric pressure of the ejector whereby further gaseous impurities are evolved, and returned to the absorption zone.

3,659,402
MULTIPLE SCREEN CONSTRUCTION
Howard Alliger, 10 Ponderosa Drive, Melville, N.Y.
Filed Mar. 30, 1970, Ser. No. 23,911
Int. Cl. B01d *47/06*
U.S. Cl. 55—233 **2 Claims**



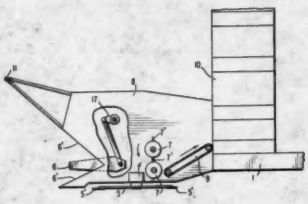
A screen network construction for air pollution control apparatus comprising a plurality of screens arranged in abutting relationship. The screens are secured tightly together to prevent clogging and to form countless tortuous paths for water and air to mix.

3,659,403
FLOATING FEEDER BEATER
Robert S. Reaves, Blue Springs, Mo., and Madel A. Bordelon, Cedar Rapids, Iowa, assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.
Filed June 1, 1970, Ser. No. 42,198
Int. Cl. A01d *41/02*
U.S. Cl. 56—10.2 **7 Claims**



A power driven feeder beater for a combine and wherein the feeder beater is pivotally mounted in slots in the header of the combine so that the feeder beater can be raised up in said slots by an excess of material being handled without interfering with the drive of the beater.

3,659,404
SUGAR CANE HARVESTERS
Roberto Henderson Kerhan, 309 10th Street, Marianao, Cuba
Filed Nov. 25, 1970, Ser. No. 92,794
Claims priority, application Cuba, Dec. 13, 1969, 210717
Int. Cl. A01d *45/02*
U.S. Cl. 56—13.9 **3 Claims**

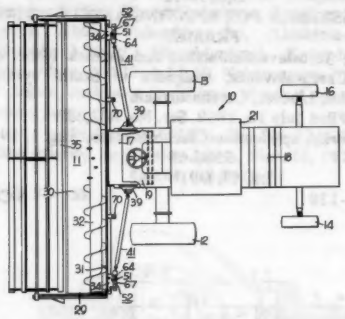


A sugar cane harvester for mounting on a prime mover and for actuation thereby wherein a supporting frame has a forward structure to position the cane for cutting and has a vertically actuated side knife to demarcate a line of cut. Rotary horizontal blades sever the cane at its base, and drum mounted cross blades cut the severed cane into appropriate lengths and deposit the same on a conveyor system.

3,659,405
QUICK DETACHABLE BRACE RODS FOR COMBINE
Ronald D. Miller, Shawnee, Kans., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.
Filed July 31, 1970, Ser. No. 59,929
Int. Cl. A01d *41/02*
U.S. Cl. 56—15.6 **1 Claim**

This invention relates to quick detachable brace rods positionable between a header and a main body of a combine

harvester and wherein the rods can be easily adjusted as to length and readily locked into position and when detached at



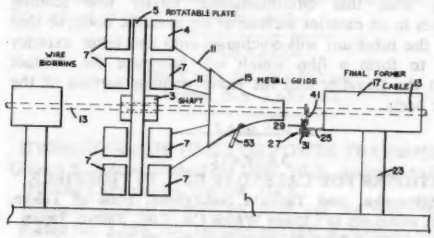
one end, such brace rods can be readily carried on the header parallel thereto.

3,659,406

STRANDED CABLE OPEN STRAND DETECTOR

Palmer Kipperberg, c/o Wilson, King and Company, 390,444 Victoria Street, Prince George, British Columbia, Canada

Filed July 27, 1970, Ser. No. 58,633
Claims priority, application Canada, Aug. 1, 1969, 058,497
Int. Cl. G01r *31/08*
U.S. Cl. 57—19 **6 Claims**



Cable inspection means comprise a probe arranged to move along the periphery of the cable and, upon encountering a gap in the strands, to move inwardly and thus provide an indication of a fault in the cable. The inward movement of the probe can be used to stop the operation of an associated cable winding machine, and/or to illuminate a relevant point on a mimic diagram of an installation including the inspection means.

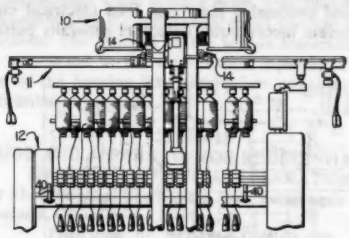
3,659,407

ENDS DOWN DETECTOR APPARATUS

David W. Saunders, Fitchburg, Mass., assignor to Parks-Cramer Company, Fitchburg, Mass.

Filed June 3, 1970, Ser. No. 43,036
Int. Cl. D01h *13/16*
U.S. Cl. 57—34 R **9 Claims**

An ends down detector apparatus for detecting the absence of any ends in a series of yarns on a textile machine, such as a spinning frame, and wherein the apparatus includes means for generating electrical pulse signals of varying magnitudes, the intact running ends of yarns cooperating with the generating means to effect electrical pulse signals of a predetermined magnitude denoting the presence of ends of yarns and wherein means are positioned in advance of the series of yarns to effect electrical pulse signals of a higher magnitude than effected by the intact ends of yarns for re-setting the electrical circuit and thereby controlling proper cyclic



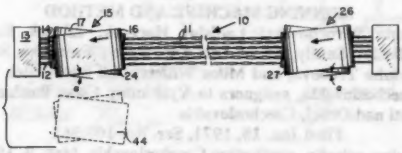
operation thereof as the ends down detector apparatus moves along the series of yarns.

3,659,408

STRANDING APPARATUS

Harvey Burr, Bronxville, N.Y., assignor to Anaconda Wire and Cable Company

Filed Mar. 13, 1970, Ser. No. 19,362
Int. Cl. D01h *7/92*; D02g *1/02*
U.S. Cl. 57—34 AT **19 Claims**



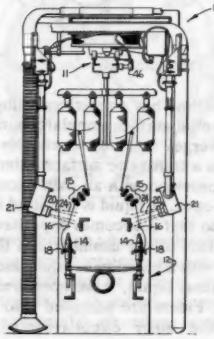
A strand is twisted by passing it between the facing surfaces of two or more pairs of parallel endless bands that are mounted at an acute angle to each other. The band mountings are pivoted periodically to reverse the direction of twist, the period being equal to the time it takes a point on the strand to pass through all the pairs of bands.

3,659,409

ELECTRIC CIRCUIT MEANS FOR TEXTILE STRAND ENDS DOWN DETECTING APPARATUS

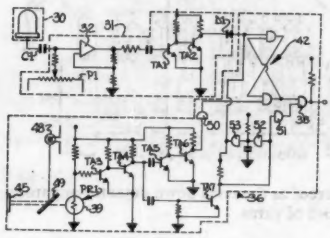
David W. Saunders, Fitchburg, Mass., assignor to Parks-Cramer Company, Charlotte, N.C.

Continuation-in-part of application Ser. No. 866,265, Oct. 14, 1969, now abandoned. This application Oct. 1, 1970, Ser. No. 77,101
Int. Cl. D01h *13/26, 13/16, 13/32*
U.S. Cl. 57—34 R **18 Claims**



Improved electric circuitry for use in an apparatus which travels a detector along textile strand processing machines

such as spinning frames for determining the absence of ends of yarn from locations therealong at which such ends normally are present and for thereby locating ends down on the textile strand processing machines. The electrical circuitry disclosed herein incorporates detectors generally pulse elec-



trical signals, pulse shaping circuits receiving pulse signals from the detectors and shaping the characteristics thereof, and logic circuits receiving shaped pulse signals and generating an output pulse on a determination that an end is absent from a location at which the same normally is present.

3,659,410

SPINNING MACHINE AND METHOD

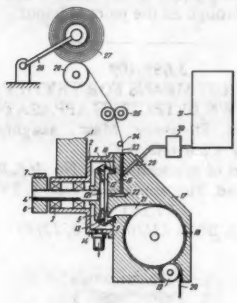
Antonin Barochovsky; Ladislav Horacek; Zdenek Krulik; Miloslav Snitily, all of Usti nad Orlici; Frantisek Stancl, Dlouha Trebova, and Milos Wilfert, Usti nad Orlici, all of Czechoslovakia, assignors to Vyzkumny Ustav Banarsky, Usti nad Orlici, Czechoslovakia

Filed Jan. 18, 1971, Ser. No. 107,361

Claims priority, application Czechoslovakia, Mar. 9, 1970, 1541/70

Int. Cl. D01h *1/12*

U.S. Cl. 57—58.89 **11 Claims**



A spinning machine has a rotary spinning chamber whose inner circumferential surface annularly surrounds its axis of rotation and diverges from an open side of the spinning chamber towards a transverse surface extending transversely to the axis and provided with an axial recess into which air-escape channels open. A liquid is admitted into the open side of the chamber so that it becomes deposited as a liquid layer on the inner surface of the chamber and the transverse surface is provided with a plurality of liquid-escape apertures for the escape of excess liquid, these apertures surrounding the axis of rotation. Fibers are admitted into the chamber for deposition on the inner circumferential surface of the chamber and in the liquid of the layer, to thereupon become converted into a yarn which is then withdrawn from the chamber. The liquid may be a dye, a yarn-treating agent, a yarn-sizing agent, an antistatic agent or the like, but serves primarily to exert drag on the fibers as the yarn is withdrawn, and may only secondarily be a treating agent.

3,659,411

RING ASSEMBLY FOR SPINNING AND TWISTING FRAMES

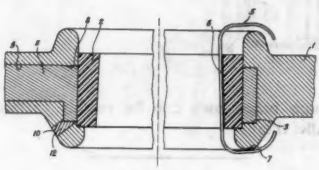
Karel Jager; Jaroslava Schlotzka, and Zdenek Kobr, all of Liberec, Czechoslovakia, assignors to Statni vyrkumny ustav textilni, Liberec, Czechoslovakia

Filed July 16, 1969, Ser. No. 842,323

Claims priority, application Czechoslovakia, Aug. 1, 1968, 5586-68

Int. Cl. D01h *7/62*

U.S. Cl. 57—120 **8 Claims**



A ring spinner in which a traveller slides along the inner periphery of a plastic ring. The ring is carried by a metallic body which has a lower annular surface portion also slidably engaged by the rotating traveller. The metallic body has an inner peripheral region where the plastic ring is located to be supported by the metallic body, and at this inner peripheral region the metallic body is formed with a circumferential cavity communicating with a source of lubrication. The metallic body is also formed with a plurality of ducts communicating with this circumferential cavity and leading therefrom to an exterior surface of the metallic body, so that part of the lubricant will discharge onto the latter exterior surface to form a film which will lubricate the contact between the traveller and the lower annular surface of the metallic body.

3,659,412

POSITIONER FOR CALENDAR DIAL IN TIMEPIECE

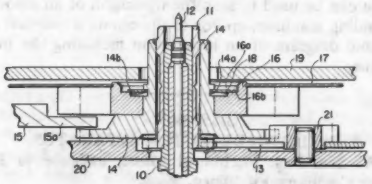
Kenji Miyasaka, and Yasuaki Nakayama, both of Tokyo, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed June 25, 1970, Ser. No. 49,722

Claims priority, application Japan, June 26, 1969, 44/60012; Feb. 6, 1970, 45/12288

Int. Cl. G04b *19/24*

U.S. Cl. 58—4 **1 Claim**



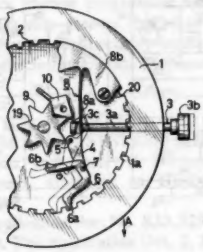
The positioner for the claendar dial fitted in a calendar timepiece is adapted to keep the dial in its working position in a highly stabilized manner. Since the idle distance between the dial plate and the star wheel of the timepiece varies on account of unfavorable deflections or deformations of the dial plate, the stabilizing positioner comprises a resilient ring made from a plate the inner periphery of which abutts upon a first mounting shoulder formed on the cannon wheel of the timepiece and the outer periphery of which abutts on a second mounting shoulder formed on the star wheel.

3,659,413

SINGLE POSITION DATE OR DAY CORRECTOR WITH GRAVITY CONTROLLED CLUTCH

Kazuo Tanaka, 3-105, Seki-machi, Nerima-ku; Toshihiko Kanayama, 2-217, Higashi-ohkubo, Shinjuku-ku; Tetuya Yasuda, 5-16-4, Higashiikebukuro, Toshima-ku; Hidetaka Tutiya, 1101, Fukushima-cho, Akishima-shi; Yoshio Kikuchi, 2-22-17, Higashiyotsugi, Katsushika-ku, and Takeo Muto, A-143, 4-13-20, Nakameguro, Meguro-ku, all of Japan, assignors to Citizen Match Company Limited, Tokyo, Japan

Filed Mar. 16, 1971, Ser. No. 124,695
Claims priority, application Japan, Mar. 16, 1970, 45/21490
Int. Cl. G04b *19/24*
U.S. Cl. 58—58 1 Claim



In a calendar correction mechanism for a timepiece a double pawl member is freely mounted on a movable pin for pivotal movement under the influence of gravity for selective engagement with a day star wheel or a date calendar dial. A mechanical motion transmitting train is arranged between an elongated operating stem and the movable pin to shift the pawl member for transmitting step motion to either the day star wheel or the date calendar dial.

ERRATUM

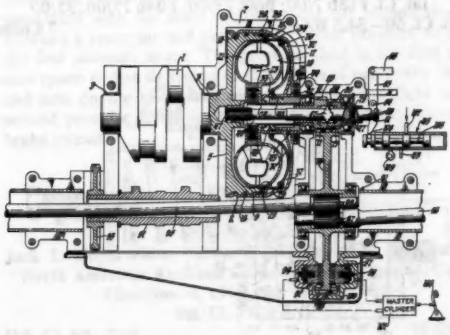
For Class 58—88 SC see:
Patent No. 3,659,383

3,659,414

HYDRODYNAMIC UNIT FOR POWER TRANSMISSION

Gilbert K. Hause, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Original application Mar. 10, 1969, Ser. No. 805,745, now Patent No. 3,590,966. Divided and this application Nov. 23, 1970, Ser. No. 91,812
Int. Cl. F16d *31/06, 33/00*
U.S. Cl. 60—54 7 Claims



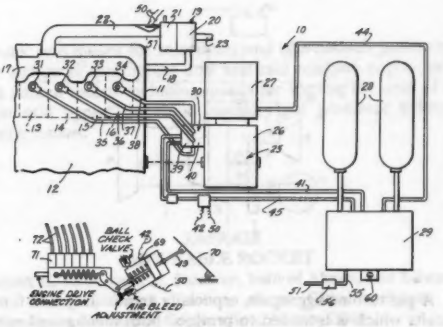
Power transmission in which the input rotor of a hydrodynamic torque-transmitting unit and a rotatable transmission input are selectively clutched and unclutched to control power flow through the unit. Controls associated with a gear selector mechanism for forward and reverse gearing effect the momentary disconnection of the input rotor and the transmission input when shifting gears. Disc brakes selectively engageable with the differential input provide vehicle service brakes. The housing of the torque-transmitting unit is rigidly connected to the transmission input by deforming a portion of the housing into appropriate openings formed in the transmission input.

3,659,415

METHOD AND APPARATUS FOR REDUCING EXHAUST EMISSIONS DURING ACCELERATION

Arthur M. Brenneke, New Castle, Ind., assignor to TRW Inc., Cleveland, Ohio

Filed Aug. 17, 1970, Ser. No. 64,403
Int. Cl. F02b *41/00*
U.S. Cl. 60—13 1 Claim



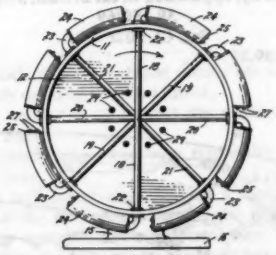
A device for increasing the performance of diesel engines and reducing exhaust emissions during acceleration by porting high-pressure air directly to the cylinders of the engine independently of the normal air supply during the compression stroke when accelerating the engine. The air is supplied to the cylinders until such a time as the normal air intake is sufficient to adequately combust the increased fuel flow.

3,659,416

VAPOR DRIVEN MOTORS

Harold Brown, 2709 S. Jackson Street, Denver, Colo.

Filed July 14, 1970, Ser. No. 54,776
Int. Cl. F03g *7/06, 3/02*
U.S. Cl. 60—25 7 Claims



A rotatable wheel through which a plurality of similar, axially spaced, tubular fluid-containing spokes diametrically extend, each spoke terminating at each of its extremities in a fluid chamber, the fluid chambers of each spoke being directed in circumferential directions exteriorally of said wheel.

An individual electrical heating element positioned in each fluid chamber, the elements being electrically and individually connected to contacts arranged in a concentric se-

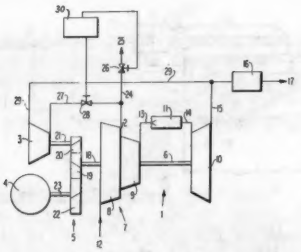
ries on said wheel so as to be individually, successively and electrically contacted to energize the elements on the rising side of said wheel to force the liquid through each spoke to the descending side of said wheel to gravitationally impart rotation to the latter.

3,659,417

GAS TURBINE UNIT FOR GENERATING MECHANICAL ENERGY AND COMPRESSED AIR

Hubert J. Grieb, Stuttgart-Botnang, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Aug. 8, 1969, Ser. No. 848,461
Claims priority, application Germany, Aug. 8, 1968, P 17 51 851.3
Int. Cl. F02c *7/02*; B64d *13/02*
U.S. Cl. 60—39.07 **11 Claims**



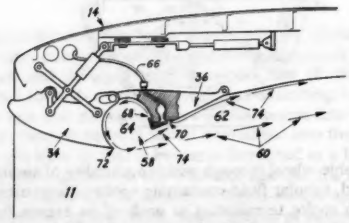
A gas turbine aggregate, especially an auxiliary unit for aircrafts which is intended to produce both mechanical energy and compressed air for loads, and in which a line branching off from the compressed air line that is supplied with compressed air from the compressor, leads to an air turbine which, in its turn, is connected with the output shaft of the gas turbine either directly or indirectly; the branch line from the compressed air line to the air turbine is provided with a valve to enable selective opening and closing of the branch line.

3,659,418

VARIABLE GAS TURBINE ENGINE AIR INTAKE

Michael Poucher, Duffield, and Michael Roy Williams, Filton, both of England, assignors to Rolls-Royce Limited, Derby, England

Filed July 13, 1970, Ser. No. 54,124
Claims priority, application Great Britain, July 30, 1969, 38,150/69
Int. Cl. F02c *7/04*
U.S. Cl. 60—39.29 **7 Claims**



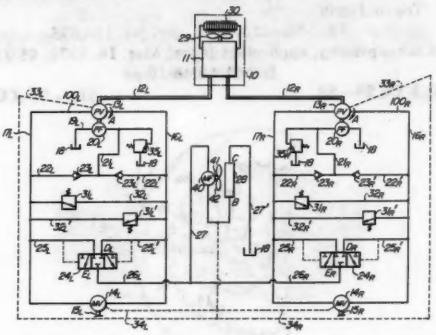
A vortex air flow is set up around the outer fringe of an air flow through a duct, the internal diameter of which increases in a downstream direction. The vortex picks up the outer fringe of the air flow in the duct and causes it to diffuse more rapidly onto the increased diameter portion of the duct, than would normally occur.

3,659,419

HYDRAULIC CIRCUIT OF HYDRAULICALLY DRIVEN VEHICLE

Toshimichi Ikeda, Ibaraki-ken, Japan, assignor to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

Filed Oct. 12, 1970, Ser. No. 79,865
Claims priority, application Japan, Oct. 13, 1969, 44/96729
Int. Cl. F15b *15/18*
U.S. Cl. 60—53 R **12 Claims**



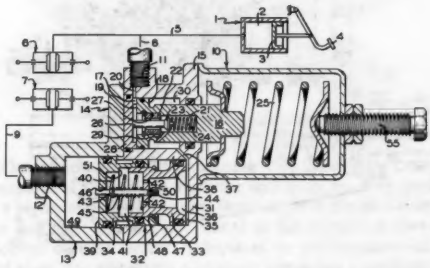
A hydraulic pump driven by an engine and a hydraulic motor to drive running wheels are connected with each other by a conduit to form a closed circuit for the circulation of hydraulic oil therethrough, and the hydraulic oil is supplied into said closed circuit from an oil tank through a hydraulic oil supply circuit including a booster pump and excess oil in said closed circuit is discharged through a hydraulic oil discharge circuit. An auxiliary hydraulic motor having a fan on the drive shaft thereof is provided at one point of either the hydraulic oil supply circuit or the hydraulic oil discharge circuit, so as to be driven by the hydraulic oil passing therethrough. Further, a hydraulic oil cooling radiator is provided in the hydraulic oil discharge circuit in opposed relation to said fan to be cooled by the latter. Therefore, the position of the hydraulic oil cooling radiator can be freely selected and a sufficient cooling capacity can be obtained.

3,659,420

BRAKE SYSTEM FOR VEHICLES

Erich Reinecke, Hannover, Germany, assignor to Westinghouse Bremsen-und Apparatebau G.m.b.H., Hannover, Germany

Filed Aug. 19, 1970, Ser. No. 65,030
Int. Cl. F15b *7/00*; B60t *13/00*; F04b *17/00, 35/00*
U.S. Cl. 60—54.5 HA **7 Claims**



A fluid pressure brake system having a common master cylinder for providing control braking pressure for brake

cylinders on both the front and rear axles of a vehicle, said brake system being characterized by a fluid pressure regulator effective, subsequently to initiation of supply thereto of control pressure from the master brake cylinder and during low range braking up to a certain degree of said control pressure, for effecting delivery of respective braking pressures to the front and rear axle cylinders at one proportion such that the braking pressure at the front axle cylinders increases responsively to increasing control pressure at a lesser rate than the rate of increase at the rear axle cylinders, said fluid pressure regulator being operative responsively to said control pressure in excess of said certain degree during high range braking for effecting delivery of braking pressures to the front and rear axle brake cylinders at a different proportion such that the increase in said delivered pressure to the front axle cylinders, during progressive increase in control pressure occurs at a rate greater than that at the rear axle cylinders to compensate for inertially induced axle load displacement as the vehicle retardation increases.

3,659,421

HYDRAULIC BRAKING SYSTEMS FOR VEHICLES

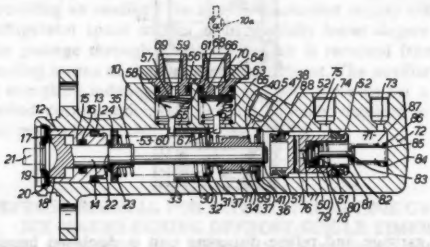
Alexander J. Wilson, and Stuart B. Dawson, both of Warwickshire, England, assignors to Girling Limited, Birmingham, England

Continuation of application Ser. No. 833,329, June 16, 1969, now abandoned. This application Oct. 2, 1970, Ser. No. 77,708

Claims priority, application Great Britain, June 14, 1968, 28,296/68; 28,299/68; Apr. 1, 1969, 16,888/69

Int. Cl. F15b 7/00

U.S. Cl. 60—54.5 P **18 Claims**



A power-operated tandem master cylinder includes first and second pressure spaced located respectively between a main piston and a secondary piston, and between the secondary piston and a closed end of a cylinder bore in which the piston work. A pair of axially spaced spring loaded tilting valves are adapted to be actuated upon movement of a rod associated with the main piston to cut off communication between a reservoir and permit fluid under pressure to enter the first pressure space. The pressure fluid in the first pressure space is then delivered to the brakes of one brake circuit and acts on the secondary piston to pressurize fluid in the second pressure space for delivery to the brakes of another brake circuit.

3,659,422

METHOD AND APPARATUS FOR AIRCRAFT PROPULSION

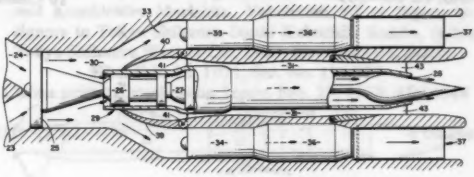
Jack I. Hope, Palos Verdes Peninsula, Calif., assignor to North American Rockwell Corporation, El Segundo, Calif.

Filed Nov. 4, 1966, Ser. No. 592,086

Int. Cl. F02k 3/12

U.S. Cl. 60—224 **18 Claims**

1. An aircraft propulsion system comprising a main gas generator, an air bypass duct associated with said main gas generator for passing air around said main gas generator; at least one auxiliary gas generator located adjacent to said main gas generator; means for compressing inlet air, said means being driven by said main gas generator; means for directing the output air of said compressor means to the inlet of said main gas generator, said air bypass duct and said auxiliary gas generator; said main gas generator, bypass duct and auxiliary engine each having a separate exhaust nozzle



means; and means for selectively and alternatively governing the airflow in said bypass duct and said auxiliary engine, said last named means including means for varying the area of at least said bypass duct and auxiliary gas generator exhaust nozzle means.

3,659,423

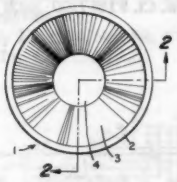
MOVEABLE ROCKET

Robert C. Lair; Julia H. Pakurar, both of Akron, and Edward G. Stricker, North Canton, all of Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

Filed Sept. 17, 1964, Ser. No. 397,136

Int. Cl. F02k 1/24

U.S. Cl. 60—232 **9 Claims**



1. In a rocket motor exhaust nozzle the combination of a nozzle body defining a venturi throat,

an insert wear ring to protect the venturi throat of the nozzle body,

a fixed annular mounting base removably receiving the nozzle body,

a flexible seal membrane effecting a sealed relationship between the mounting base and the nozzle body, and allowing controlled relative movement therebetween,

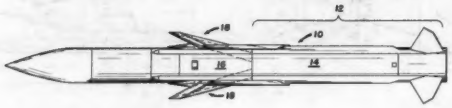
a concentric ring operatively mounted by said seal membrane between the nozzle body and the mounting base,

first means pivotally mounting said nozzle body to said concentric ring,

second means pivotally mounting said mounting base to said concentric ring at 90° relation to said first pivotal mounting means to achieve a gimbal effect between said nozzle body and said mounting base, and

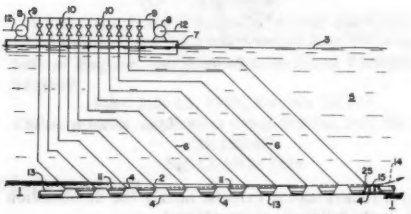
means to controllably and selectively apply pressure to the nozzle body to effect pivoting thereof to a desired relation with respect to the mounting base.

3,659,424
STOWABLE AIR SCOOP
Albert S. Polk, Jr., Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Navy
Filed Oct. 7, 1970, Ser. No. 78,771
Int. Cl. F02k 9/06
U.S. Cl. 60—269 10 Claims



A foldable ram air scoop for gathering and channeling external air into a secondary thrust chamber, or afterburner, of an air-augmented thrust propelled missile is provided. The scoop is deployable prior to launch, being foldable against the missile body while stowed within a volume restricted storage magazine. The present air scoop essentially comprises a two-stage folding mechanism which compactly holds the scoop body against the missile, controllably deploys the scoop to a desired configuration, and positively locks the scoop in the proper position.

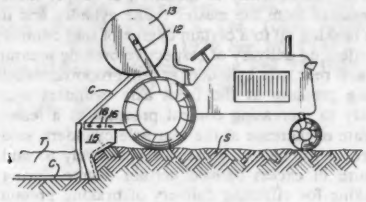
3,659,425
METHOD AND APPARATUS FOR BURYING PIPELINE
Pieter J. De Geeter, Rijswijk, Netherlands, assignor to Shell Oil Company, New York, N.Y.
Filed May 25, 1970, Ser. No. 40,407
Claims priority, application Great Britain, May 23, 1969, 26,392/69
Int. Cl. F16l 1/00; E02f 5/02
U.S. Cl. 61—72.4 3 Claims



A pipeline is buried in the bottom of a body of water by fluidizing sediments which compose the bottom adjacent the pipeline so that the pipeline sinks by its own weight into the fluidized sediments.

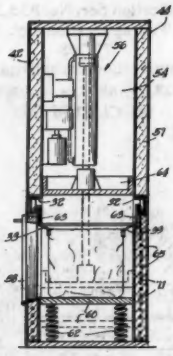
3,659,426
CABLE LAYING PLOW
Robert H. Caldwell, P. O. Box 403, Jacksonville, Ill.
Filed Mar. 26, 1970, Ser. No. 29,337
Int. Cl. B63b 35/04; A01b 13/08
U.S. Cl. 61—72.6 2 Claims

A plow for laying service cable underground beneath a sodded surface. The plow includes a leading cutting edge which is contoured along its height so that the upper cutting portion edge for cutting sod is inclined at an obtuse angle relative to the sod as the plow slices therethrough. The lower edge portion for forming a trench is integral with and



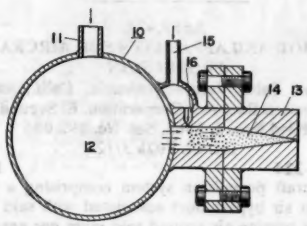
disposed rearwardly of the upper sod cutting edge portion and inclined in the opposite direction.

3,659,427
REFUSE DISPOSING UNIT
Richard D. Harza, 400 West Madison St., Chicago, Ill.
Continuation-in-part of application Ser. No. 677,206, Oct. 23, 1967, now Patent No. 3,514,969. This application Apr. 20, 1970, Ser. No. 29,805
Int. Cl. F25d 25/00
U.S. Cl. 62—63 51 Claims



A garbage and refuse disposing unit is disclosed herein. The unit includes a housing for receiving refuse of all types, a compressor mechanism for compressing the refuse and freezing means for freezing the compressed refuse into dense or solid pellet-like units.

3,659,428
METHOD FOR COOLING STEEL MATERIALS
Kazuo Kunioka; Shigenari Shimizu, both of Kawasaki, and Masaru Hirata, Fukuoka Machi, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha
Filed Aug. 14, 1970, Ser. No. 63,836
Claims priority, application Japan, Dec. 1, 1969, 44/95896
Int. Cl. F25d 17/06
U.S. Cl. 62—64 3 Claims



A method for spray cooling hot metal products in which a small amount of water is atomized in a large air flow passing

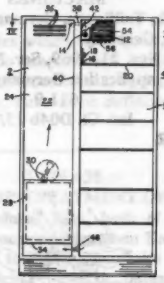
through a throttling nozzle so that a two phase high speed jet is directed against the hot metal. The water is injected into the air stream between a compressed air reservoir and the throttling portion of the nozzle.

3,659,429

REFRIGERATOR-FREEZER WITH FAST CHILL ARRANGEMENT

John A. McLean, Columbus, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 25, 1970, Ser. No. 22,499
Int. Cl. F25d *17/00*
U.S. Cl. 62—157 **7 Claims**



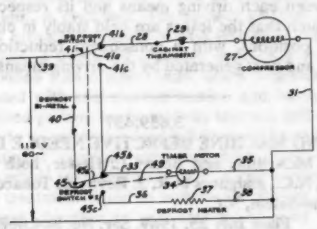
The titled apparatus in which a fast chill space is provided in the upper portion of the refrigerator compartment by providing an auxiliary fan in communication mainly with the refrigerator space and to a substantially lesser degree with the passage through which chilled air is received from the cooling means of the freezer compartment. The auxiliary fan is energized independently of the cooling means for a time period corresponding to the time typically required to chill the particular articles undergoing chilling.

3,659,430

DEFROST BIMETAL FOR INTERRUPTING TIME CYCLE ICE MAKER DURING DEFROST-SINGLE TIMER

Duane C. Nichols, and William J. Linstromberg, both of Evansville, Ind., assignors to Whirlpool Corporation

Filed June 18, 1970, Ser. No. 47,520
Int. Cl. F25c *1/10*
U.S. Cl. 62—233 **10 Claims**



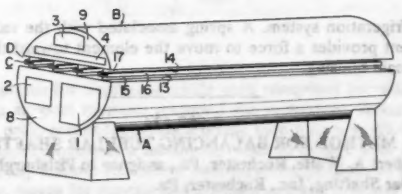
A refrigerator-freezer apparatus normally operating through freezing and defrosting portions of an operating cycle. The apparatus includes an ice maker and a timer motor that preferably also comprises the drive motor of the ice maker. A single temperature responsive switch in heat exchange relationship with the evaporator of the apparatus opens at an above freezing temperature condition of the evaporator so as to terminate operation of the defrost heater during the defrosting portion of the operation cycle and prevents cycling of the ice maker in the event of a high temperature condition, such as during start-up of the apparatus, to prevent the ice maker dumping unfrozen water into the freezer compartment of the apparatus.

3,659,431

DRUM SHAPED VESSEL ASSEMBLY

Seijiro Iwasawa, Yokohama; Masabumi Ishimura, Kokubunji, and Kenshichiro Morishita, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, (a/k/a Tokyo Shibaura Electric Co., Ltd.), Kawasaki-shi, Japan

Filed Feb. 18, 1971, Ser. No. 116,577
Claims priority, application Japan, Feb. 27, 1970, 45/16846
Int. Cl. F25b *15/04*; F28f *7/00*
U.S. Cl. 62—476 **4 Claims**



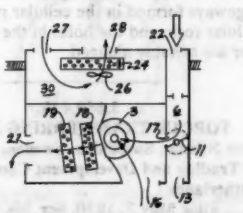
A drum shaped vessel assembly suitable for use in an absorption refrigerator comprises two elongated vessels which when assembled provide a circular cross-sectional configuration and joints disposed in the air gap defined between confronting inner surfaces of the vessels, said joints rigidly interconnecting the vessels in a direction perpendicular to the inner surfaces of the vessels but permitting relative movement thereof in the longitudinal direction.

3,659,432

DAMPER ASSEMBLY FOR AIR CONDITIONING UNIT

Dale L. Selhost, Moline, Ill., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed July 23, 1970, Ser. No. 57,560
Int. Cl. F25d *17/06*
U.S. Cl. 62—427 **8 Claims**



An air ventilating arrangement for conditioning air for a served space wherein a damper assembly is provided to regulate the flow of fresh air to a served space.

3,659,433

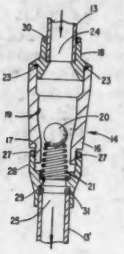
REFRIGERATION SYSTEM INCLUDING A FLOW METERING DEVICE

David N. Shaw, Liverpool, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jan. 2, 1970, Ser. No. 88
Int. Cl. F25b *41/06*
U.S. Cl. 62—511 **2 Claims**

A refrigerant flow metering device for use in a refrigeration system comprising a housing having an inlet and an outlet and defining a bore disposed within its confines, the ends of which communicate with the inlet and outlet, said bore

being of a variable cross section to form a variable passage. A valve element positioned within the bore is capable of movement therein in response to changes in pressure in the



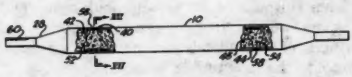
refrigeration system. A spring associated with the valve element provides a force to move the element toward the inlet of said housing.

3,659,434

METHOD FOR BALANCING TUBULAR SHAFTING

Robert A. Wolfe, Rochester, Pa., assignor to Pittsburgh Tubular Shafting, Inc., Rochester, Pa.

Filed Jan. 15, 1971, Ser. No. 106,656
Int. Cl. F16c *1/00*
U.S. Cl. 64—1 R 9 Claims



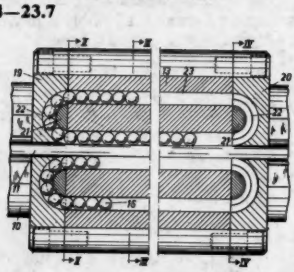
Tubular shafting having a metallic outer tubular member and a cellular resinous core is both kinetically and dynamically balanced by drilling holes in the outer metallic tubular member at locations where additional weight is required to balance the shafting. A predetermined amount of molten metal is poured through the drilled holes into the internal portion of the tubular shafting. The molten metal flows through passageways in the cellular resin core and solidifies against the inner wall of the outer metallic tubular member. The passageways formed in the cellular resin are filled with a similar cellular resin and the holes in the outer metallic tubular member are suitably plugged.

3,659,435

TORQUE TRANSFERRING DEVICE

Sven Walter Nilsson, Savedalen, Sweden, assignor to SKF Industrial Trading and Development Company N.V., Amsterdam, Netherlands

Filed May 7, 1970, Ser. No. 35,456
Claims priority, application Sweden, May 9, 1969, 6573/69
Int. Cl. F16d *3/06*
U.S. Cl. 64—23.7 2 Claims



A device for transferring a torque may comprise an outer tubular component enclosing a shaft, the diameter of which is only slightly less than the cylindrical, internal surface of the outer component. These two components cooperate through the intermediation of balls operating in parallel, matching grooves in the two components.

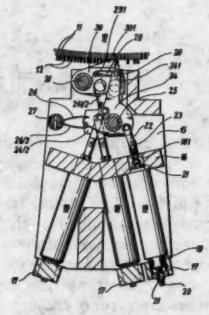
To ensure a recirculation of the balls in unloaded condition and to ensure a smooth running of the balls, the grooves are arranged in at least three pairs in which two grooves on opposite sides of a ridge in the inner component will cooperate with two grooves arranged at opposite sides of a groove in the outer member to form two runways, which are each connected to a return passage in the outer component.

3,659,436

PATTERN ATTACHMENT FOR CIRCULAR KNITTING MACHINES

Ernst-Dieter Plath, Tailfingen, Germany, assignor to Mayer & Cie, Tailfingen, Germany

Filed Nov. 21, 1969, Ser. No. 878,642
Claims priority, application Germany, Dec. 4, 1968, 18 12 611.9
Int. Cl. D04b *15/78*
U.S. Cl. 66—50 R 14 Claims



Pattern controlling mechanism for circular knitting machines having a rotating needle carrier and setting members which act upon control jacks for the needles, said control jacks being vertically displaceable and being swingable according to a desired pattern. The mechanism is provided with pattern levers which act upon the butts of the control jacks, the pattern levers, which control the positioning of butts, being selectively moved into terminal rest and working positions by electromagnetic driving means. The driving linkage between each driving means and its respective pattern lever is such that the levers are held stably in either of their terminal positions, with a consequent reduction of power required and heat generated by the driving means.

3,659,437

KNITTING MACHINE DEFECTIVE NEEDLE DETECTOR

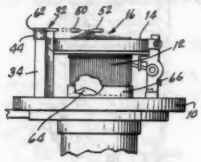
Colin S. McArthur, and Benny L. Hester, both of Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed July 25, 1969, Ser. No. 844,808
Int. Cl. D04b *35/18*
U.S. Cl. 66—157 11 Claims

A circular knitting machine, comprising a device for detecting defective needles by detecting the absence of a needle hook from its proper place. The device is placed at a locality adjacent the circular path of needle travel, and the needles are raised by a cam so that the hook of every good and properly positioned needle intercepts a collimated bead of radiant energy. The beam is not intercepted properly by a needle which has a broken, bent or otherwise defective hook or which, because of broken butt or other causes, has not been raised properly. The detector is connected to an alarm

and may also be connected to a conventional stop motion device.

Alternatively, a small magnet mounted on a piezoelectric crystal or magnetic pickup is positioned in the proximity of



the hooks of the needles which have been raised by the cam referred to above. The magnet will be deflected by each passing needle of proper constitution and attitude in substantially the same manner, but will be deflected differently by a defective needle.

3,659,438

APPARATUS FOR TREATMENT OF A FABRIC

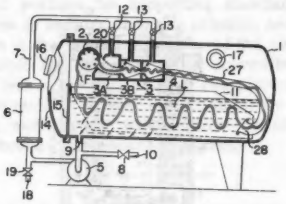
Matsubei Chiba; Kiyoharu Kito, both of Nagoya; Hiroshi Mizutani, Kuwana-gun, and Masayasu Kachi, Niwa-gun, all of Japan, assignors to Nihon Senshoku Kikai Kabushiki Kaisha, Ama-gun, Aichi Prefecture, Japan

Filed Oct. 2, 1970, Ser. No. 77,401

Claims priority, application Japan, Aug. 10, 1970, 45/69270

Int. Cl. B05c *3/02*

U.S. Cl. 68—177 **2 Claims**



A method for liquid treatment of a fabric, in which the fabric to be treated in a rope form or web form is circulated in a predetermined direction within a treatment bath in a treatment tank, is disclosed. The subject method comprises the steps of providing outside of said treatment bath in said treatment tank, a treatment chamber consisting of a shower section provided with a fabric inlet, and a treatment section communicated with said shower section and having at least one constricted portion in the midway thereof, and surrounding said fabric so as to pass said fabric therethrough; providing a treatment conduit extended from said treatment chamber to within said treatment bath in said treatment tank; supplying a treatment liquid to within said chower section of said treatment chamber to seal said fabric inlet with said liquid during the circulating process of the fabric; then jetting said treatment liquid in the direction of travelling of the fabric within said treatment section to cause the treatment liquid to spout through the clearance between the fabric and said constricted portion when the fabric is passing through said constricted portion, and thereby to cause said fabric to carry out a shaking motion positively; and further leading said fabric from the outlet of said treatment chamber through said treatment conduit to within said treatment both while maintaining said fabric to be immersed in said treatment liquid. An apparatus for carrying out the above method is also disclosed.

3,659,439

YARN TREATMENT APPARATUS

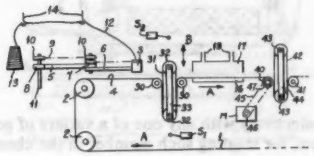
John Raymond Tindall, Guiseley, England, assignor to Courtaulds Limited, London, England

Filed Nov. 16, 1970, Ser. No. 89,991

Claims priority, application Great Britain, Nov. 19, 1969, 56,628/69

Int. Cl. D06c *1/06*

U.S. Cl. 68—5 D **8 Claims**



Apparatus for treating a textile yarn comprises an endless flexible support member mounted for movement around a closed path, means for laying a textile yarn onto a surface of said support member, a treatment vessel to engage with and completely enclose successive yarn-receiving portions of said surface, means for moving said portions stepwise into and out of said treatment vessel, and a yarn take-off apparatus operable to withdraw treated yarn from said portions. The endless flexible support member may be mounted for intermittent stepwise movement or for continuous movement around a closed path.

3,659,440

LIQUID DRAIN STRUCTURE FOR HIDE PROCESSING APPARATUS

Lee R. Lyon, 800 North Atlantic St., Mission Hills, Kans.

Filed Feb. 16, 1971, Ser. No. 115,322

Int. Cl. C14c *15/00*

U.S. Cl. 69—30 **8 Claims**

A liquid drain structure is disclosed for apparatus for processing animal hides and comprises an elongated conduit in a spiral within a treatment zone of a rotated inclined drum and a perforated wall defining a lower chamber within the drum for receiving liquid from the conduit and a pump for removing liquid from the lower chamber.

3,659,441

APPARATUS FOR BATCH DYEING

Manfred Schulerer, Erbach/Odenwald, Germany, assignor to Bruckner-Apparatebau Michelstadt GmbH, Erbach/Odenwald, Germany

Filed Dec. 15, 1970, Ser. No. 98,315

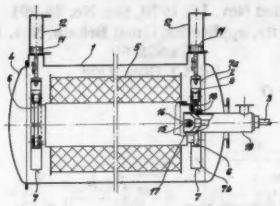
Claims priority, application Germany, Dec. 23, 1969, G 69 49 681.7; Oct. 21, 1970, G 70 38 866.8

Int. Cl. B05c *8/02*

U.S. Cl. 68—4 **11 Claims**

A dyeing chamber has a fluid-tight cover in its front wall, and has a drive shaft extending through a fluid-tight seal in its

rear wall. A fitting on the end of the drive shaft is adapted to



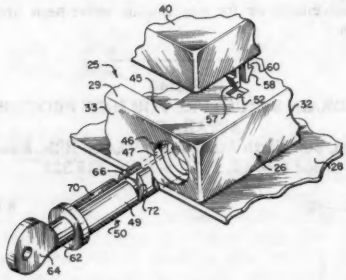
be coupled selectively with any one of a variety of goods-carrying members, for rotating such member in the chamber.

3,659,442

LOCKING DEVICE INCLUDING CAMMING KEY FOR RELEASING SPRING CATCH MEMBERS

Vito Cellini, and Ronald J. Casale, both of Bronx, N.Y., assignors to said Casale, by said Cellini

Filed Jan. 18, 1971, Ser. No. 106,983
Int. Cl. E05b *65/52*; E05c *19/06*
U.S. Cl. 70—63 9 Claims



A locking device includes a lock base, hinged cover and key. The lock base has a key hole extending inwardly of one end parallel to the top of the lock base, and one or more holes in the top opening into the keyhole. The cover has one or more pairs of slightly spaced spring prongs insertable into the holes in the lock base. Shoulders on tips of the prongs engage underneath rims of the holes to keep the cover closed. The key has camming portions defining circumferential grooves with flaring faces for engaging the prongs, squeezing them together and lifting them clear of the bottom rims of the holes in the lock base when the key is rotated. The lock base may have recesses at the underside of its top for receiving and concealing the tips of the prongs. The camming portions may be radially extending camming members engageable with the tips of the prongs in the recesses when the key is turned in the keyhole.

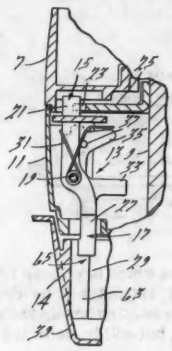
3,659,443

STEERING COLUMN LOCK INHIBITOR

Jeremy T. Ball, Birmingham, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Sept. 30, 1970, Ser. No. 76,916
Int. Cl. B60r *25/02*
U.S. Cl. 70—186 8 Claims

Steering shaft lock inhibitor including a rotatable generally bowl-shaped member having a blocking section on the inside thereof. The blocking section prevents movement of a steering shaft locking lever assembly into a locking position. The



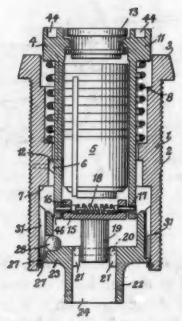
blocking section can be manually rotated out of the path of the lever assembly to permit locking of the steering shaft.

3,659,444

LOCKS

John F. Wellekens, 51 East 42nd St., New York, N.Y.

Filed Apr. 30, 1970, Ser. No. 33,228
Int. Cl. E05b *17/04*
U.S. Cl. 70—360 7 Claims

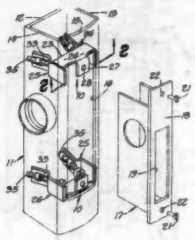


A lock having an outer tubular casing within which an inner housing or sleeve is axially and rotatably movable, the sleeve containing a lock mechanism provided with a latch projecting laterally through an opening in the wall of the sleeve. The sleeve is spring-biased in a manner to enable it to be partially projected or advanced out of the casing while the latch is in a retracted position. When the latch is extended it engages against a shoulder provided on the wall of the casing and this holds the sleeve retracted within the casing. The casing is closed at its rear end by a cup which can be connected to bolt-actuating means or to other closure controlling means. The sleeve has a projection for coupling it to the cup only when the sleeve is disposed partially out of the casing. When the sleeve is retracted or is wholly located within the casing and is held in that position by the engagement of the extended latch against the shoulder, the coupling projection will be detached from the cup whereby the sleeve can then be freely rotated without causing rotation of the cup. Locking means is provided for holding the cup against rotation while the sleeve is retracted into the casing.

3,659,445
LOCK MOUNTING CLIP AND PLACEMENT TOOL THEREFOR

Charles L. Eads, Palm Springs, and Billie G. Nail, La Crescenta, both of Calif., assignors to Adams Rite Manufacturing Company, Glendale, Calif.

Filed Aug. 14, 1970, Ser. No. 63,766
Int. Cl. E05b 9/08
U.S. Cl. 70—451 11 Claims

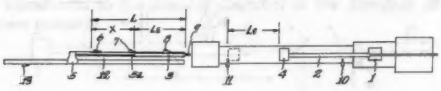


Lock mounting means for securing a lock frame structure edgewise in a receiving opening provided in a wall of a hollow narrow stile door frame by means of a clip assembly arranged to be positioned by means of a placement tool and thereafter secured in a mounted position by means of an appropriate tool, such as a screw-driver, at the opposite ends of the opening, each clip assembly having a rigid body of generally H-shape configuration constructed from a generally flat plate material to provide an integral bridging portion with side legs at its ends, in which a tongue extends from the bridging portion and has an opening for receiving a lock anchoring member such as a screw. The side legs have diverging end portions for supporting associated wedging screws thereon in angular diverging relation, and with their head portions in the mounting position of the clip assembly, being accessible for actuation by a screwdriver inserted through the lock receiving opening. The placement tool is releasably engageable with the clip assembly by means of a spring detent, and is easily detached from the clip assembly after it is anchored in its mounting position.

3,659,446
METHOD AND DEVICE FOR FEEDING OF COLD PILGER MILLS

Josef Gerretz, Suechteln; Willi Hagedorn, and Karl-Heinz Kemmerling, both of Moenchengladbach, all of Germany, assignors to Wean Industries, Inc., Youngstown, Ohio

Filed Oct. 21, 1970, Ser. No. 82,739
Int. Cl. B21b 21/04
U.S. Cl. 72—14 6 Claims

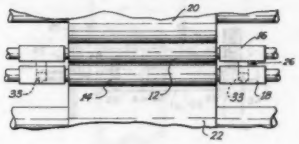


The invention refers to a method and apparatus for feeding shells of variable lengths in a pilger mill to effect optimum efficiency. When the entry pusher of the mill starts moving the length of newly fed shell is measured and this measurement is transmitted to a memory counter, and by means of a program control the distance travelled by the feed carriage is regulated to the length of the newly fed shell, whereby the feed carriage moves only far enough so that on its return to a starting position a space is left which is equal to the length of the newly fed shell.

3,659,447
PLUNGER AND ACCUMULATOR

Richard E. Naber, and William D. Hamilton, both of Middletown, Ohio, assignors to Armco Steel Corporation, Middletown, Ohio

Filed Aug. 25, 1970, Ser. No. 66,674
Int. Cl. B21b 31/20, 31/32
U.S. Cl. 72—240 5 Claims

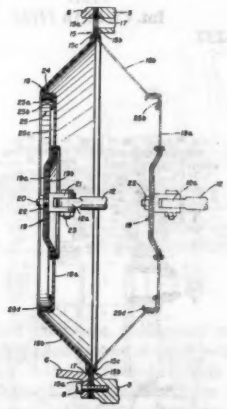


A work roll balance plunger and accumulator for the mill stands of a rolling mill which is positioned in at least two of the work roll chocks so as to support the upper work roll chocks to substantially reduce hydraulic shock pressure drops or peaks during the expansion or compression of the mill stand as rolling strip enters or leaves, respectively.

3,659,448
GAS METER DIAPHRAGM HAVING INTERMEDIATE STABILIZING AND TENSIONING RING

Karl L. Schaus, 224 East 6th Street, Tempe, Ariz.

Filed July 22, 1970, Ser. No. 57,141
Int. Cl. G01f 15/16; F16i 3/00
U.S. Cl. 73—279 1 Claim

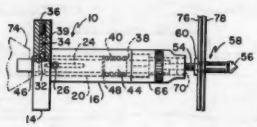


A gas meter diaphragm characterized by a rigid tensioning and stabilizing ring secured to the flexible diaphragm body intermediate a rigid, outer mounting rim and a centrally disposed rigid center pan for the purpose of eliminating wrinkles in the flexing portion of the diaphragm, and providing an intermediate, slightly yieldable, annular area of flexible material under tension around the center pan portion of the diaphragm assembly. The diaphragm being further characterized by a comparatively lighter weight, self-supporting central portion which eliminates the need for the usual carrier wire assembly employed to movably support the center pan portion of prior art diaphragms.

3,659,449
COMBINATION RIVET INSTALLATION APPARATUS AND SELF-DRILLING RIVET

Robert G. Abernathy, Richmond, Ind., assignor to Avco Corporation, Richmond, Ind.

Filed Mar. 13, 1970, Ser. No. 19,216
Int. Cl. B21d *9/05*
U.S. Cl. 72—391 7 Claims

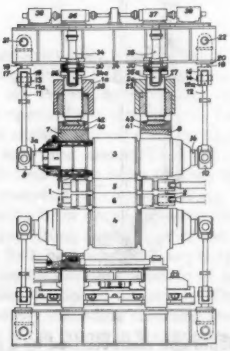


A rivet installation apparatus for use in cooperation with self-drilling rivets is disclosed. The disclosure provides for the installation of a rivet through two or more sheets of material, said installation being accomplished from one side. With this apparatus and rivet combination, an operator may place two or more sheets of material together, drill a hole through the sheets and upset the rivet while operating from one side of the material in one operation with a single tool.

3,659,450
ROLLING MILL OR CALENDAR WITH CROWN CONTROL OF THE ROLLS FOR ROLLING FLAT MATERIAL

Hans Siegfried Metzger, St. Ingbert-Saar, Germany, assignor to Moeller & Neumann GmbH, Ingbert/Saar, Germany

Filed Nov. 19, 1969, Ser. No. 878,034
Claims priority, application Germany, Nov. 20, 1968, P 18 09 975.7
Int. Cl. B21b *31/32*
U.S. Cl. 72—237 5 Claims

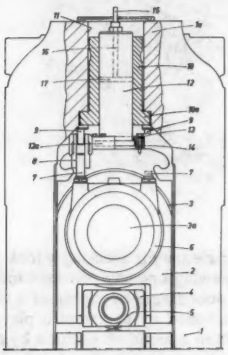


In a rolling mill or calender for flat material, such as sheets or strips, a bridge member is disposed transversely across the rolling mill frames and is supported by the upper end faces of the screwdown pressure screws and is secured thereto so as to follow the screwdown movement while hydraulic pressure units attached to the bridge member and neck extensions of one of the rolls exert roll bending pressure thereon for the purpose of crown control.

3,659,451
SCREWDOWN DEVICE FOR ROLLING MILL FRAMES AND CALENDERS

Hans Siegfried Metzger, St. Ingbert-Saar, and Fred Gilges, Gersweiler-Saar, both of Germany, assignors to Moeller & Newmann GmbH, Ingbert am Saar, Germany

Filed July 24, 1969, Ser. No. 844,369
Claims priority, application Germany, Aug. 1, 1968, P 17 52 900.9
Int. Cl. B21b *31/24*
U.S. Cl. 72—248 8 Claims

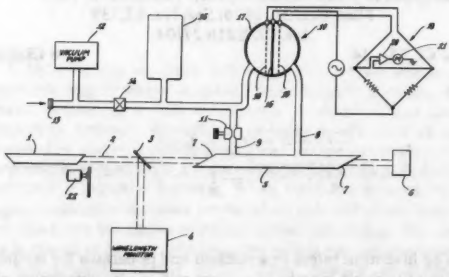


A shrink connection is used between a round pin and a bushing which may be moved relative to each other during screwdown movements of the rolls. The shrink connection permits a rigid and threadless transmission of the rolling force directly to the frame and not through the screwdown device of a rolling mill, said shrink connection may be hydraulically cancelled or released.

3,659,452
LASER EXCITED SPECTROPHONE

John G. Atwood, West Redding, and Edwin L. Kerr, Ridgefield, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Apr. 22, 1969, Ser. No. 818,328
Int. Cl. G01n *21/00*
U.S. Cl. 73—23 5 Claims

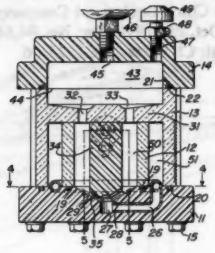


A system for measuring the radiant energy absorptivity of gaseous samples. There is provided a laser source, a cell for containing the sample gas in the path of the radiation and a low frequency differential pressure transducer coupled to the sample cell. The laser beam is partially absorbed producing a pressure rise in the gas which is then measured.

3,659,453
FLUID SYSTEM LEAK DETECTOR

Dougall C. Martin, Jr., 313 Eller Avenue, Englewood, Ohio

Filed June 26, 1970, Ser. No. 50,111
Int. Cl. G01m *3/06, 3/26*
U.S. Cl. 73—40 6 Claims



A fluid system leak detector comprising concentric inner and outer annular liquid chambers joined by an interconnecting conduit, the outer chamber being communicable with the fluid system to be checked and the inner chamber being in vented communication with an overlying test pressure chamber, a transparent tube horizontally disposed within said outer chamber and in fluid transmitting communication with the opening of said interconnecting conduit into said outer chamber and a liquid confined within said annular chambers movable in response to a pressure differential between the fluid system and the test pressure chamber wherein the quantity of the liquid is such that, when it is in either of said annular chambers it will not fill the same, either to the point of communication with the fluid system in the case of the outer chamber or to the vent to the test pressure chamber in the case of the inner chamber. Upon association of the detector with a fluid system having a pressure differential from ambient pressure the liquid will move from one annular chamber to the other and the transfer of all of the liquid to the chamber toward which it so moves is completed by temporarily opening the valve connecting the test pressure chamber with the atmosphere. Upon the closing of this valve, any loss of pressure in the fluid system will create a pressure differential between it and the test pressure chamber in response to which the liquid will move in the direction of the lower pressure indicating a leak in four distinct phases; viz., movement of the liquid through the horizontally disposed tube, a rising of the liquid in the annular chamber in the direction of the lower pressure, a further reading of the last of the liquid passing through the horizontally disposed tube, and finally bubbling of gas through the liquid after it is entirely transferred to the annular chamber in the direction of the lower pressure.

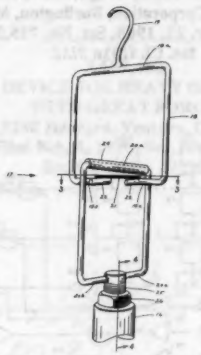
3,659,454
FABRIC STIFFNESS TESTING APPARATUS

Jack R. Stevenson, Winnsboro, S.C., assignor to Uniroyal, Inc., New York, N.Y.

Filed May 1, 1970, Ser. No. 33,600
Int. Cl. G01n *3/00*
U.S. Cl. 73—103 7 Claims

An apparatus for testing the stiffness of fabrics, comprising a testing machine fitted with a pair of linked, mutually orthogonal jaw members which support and load a fabric specimen therein, the machine providing a record of the force-deflection behavior of the specimen under test.

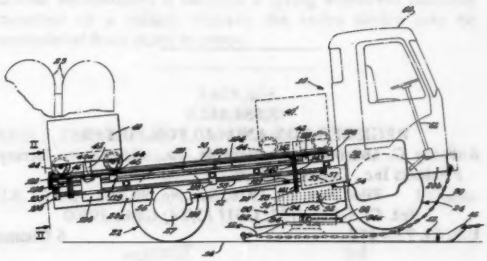
The foregoing abstract is neither intended to define the invention disclosed in the specification, nor is it intended to be limiting as to the scope of the invention in any way.



3,659,455
POWER STOPPER

Billy K. Watkins, RR #1, Lovington, Ill.

Continuation-in-part of application Ser. No. 723,772, Apr. 24, 1968, now Patent No. 3,491,590, dated Jan. 27, 1970.
This application Jan. 23, 1970, Ser. No. 5,322
Int. Cl. G01l *5/13*
U.S. Cl. 73—141 R 14 Claims

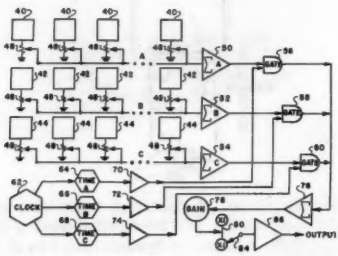


Increasing frictional resistance to forward movement is provided by a self-propelled power stopper weight transfer apparatus comprising a four-wheeled vehicle chassis on which there is positioned an elongated mass guide upon which a gear-driven mass of up to ten tons may be moved from a position over a rearward, relatively frictionless means to a forward position over a high friction sled means. A motor power means at the front end of the vehicle chassis not only allows the apparatus to be driven on a highway and acts as a return means during a contest, but also eliminates the need for a separate dead weight on the sled means. Movement of the mass on the mass guide is produced by a direct gear drive connected in the power transmission system. A cab which may be provided on the chassis also adds dead weight. A fifth wheel arrangement on the sled, the attachment of which to the chassis may be controlled from the cab, allows rapid coupling and uncoupling of the apparatus and the sled means for simple, quick and efficient operation.

3,659,456
SHOCK SPECTRUM ANALYSIS AND SYNTHESIS METHOD AND APPARATUS

Philip Marshall, Lexington, and William C. Stevens, Jr., Chelmsford, both of Mass., assignors to Marshall Research and Development Corporation, Burlington, Mass.

Filed Mar. 22, 1968, Ser. No. 715,399
Int. Cl. G01n 3/38
U.S. Cl. 73—71.6 7 Claims

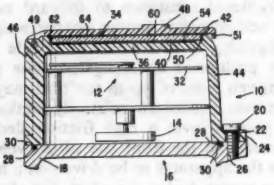


A shock spectrum analysis and synthesis method and apparatus which includes the use of a shock spectrum analyzer and a shock spectrum synthesizer. The analyzer is a special purpose analog computer which provides an automatic shock spectrum analysis of both the primary and residual spectrum by solving the equation of motion for a single degree of freedom, mass-spring-damping system and displaying the output signals on an oscilloscope or X-Y recorder. The synthesizer generates a variable transient electrical input to a vibration shaker system by generating a plurality of steady-state signals each having a different frequency and gating and summing the signals.

3,659,457
REGISTER BOX AND LID FOR METERS

Anthony C. Ostrowski, Feasterville, Pa., assignor to Hersey Products Inc., Dedham, Mass.

Filed Nov. 17, 1970, Ser. No. 90,351
Int. Cl. G01p 1/02; G01f 15/14; G04b 39/00
U.S. Cl. 73—273 6 Claims



A register box for a meter formed of a clear plastic which has a recessed face portion into which a glass plate is placed upon seating means in said recess, and affixed therein by a resilient adhesive which provides a floating support for the glass plate, whereby the surface of the register box through which readings are taken is protected and rendered scratch resistant.

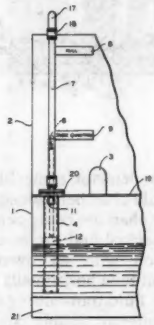
ERRATUM

For Class 73—279 see:
Patent No. 3,659,448

3,659,458
SIGHT GAUGE

William A. Bice, and Michael W. Riddle, both of Lubbock, Tex., assignors to Clark Equipment Company

Filed Oct. 28, 1970, Ser. No. 84,689
Int. Cl. G01f 23/02, 23/06
U.S. Cl. 73—306 5 Claims

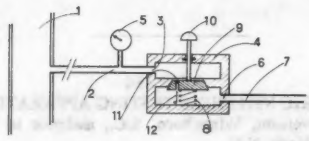


A sight gauge assembly for vertically superimposed tanks in communication with each other including a transparent sight tube communicating with the tanks and disposed alongside of the upper tank to indicate liquid level therein and a float member movable in the sight tube and extending into the lower tank for indicating the lever of liquid in the lower tank when observing the position of the float member in the sight tube.

3,659,459
DEVICE FOR MEASURING THE PRESSURE OF A FLUID FLOWING IN A PIPE

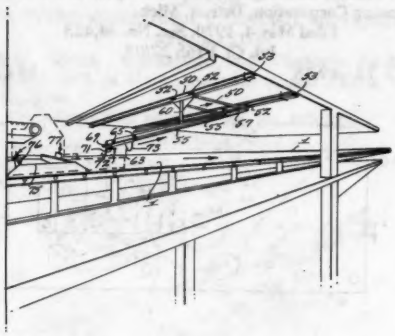
Bernard Moreau, Nantes, France, assignor to Creusot-Loire, Paris, France

Filed June 2, 1970, Ser. No. 42,673
Claims priority, application France, July 4, 1969, 6922716
Int. Cl. G01l 7/00
U.S. Cl. 73—388 R 3 Claims



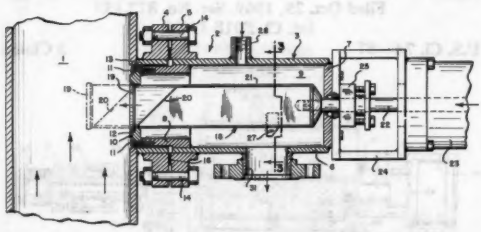
A measuring device comprising an auxiliary pipeline for coupling between a main pipe whose pressure is to be determined and a second pressure source, the auxiliary pipeline including a pressure gauge and a calibrated orifice, the former nearest the main pipe.

3,659,460
APPARATUS FOR SAMPLING ORE AND THE LIKE
John A. Cahill, CP2C 00 966, Rio De Janeiro, Brazil
Filed June 24, 1970, Ser. No. 49,424
Int. Cl. G01h *1/20*
U.S. Cl. 73—421 R 3 Claims



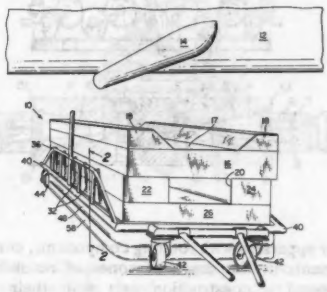
An elongate sample collector or container having a longitudinal dimension corresponding to the useable (between guides) width of the conveyor belt is moved while empty onto the conveyor belt in such manner as to extend across the same at a position where it receives, from above, that portion of the particulate material which otherwise would have fallen onto the conveyor belt; a carriage which is movable longitudinally of the conveyor belt removes the sample collector from the conveyor belt; and then another carriage moves the first mentioned carriage and the sample collector in an angular direction away from the conveyor belt preparatory to obtaining the desired analysis.

3,659,461
LINE SAMPLING DEVICE
Albion J. Thompson, Margate, Fla., assignor to Great Northern Nekoosa Corp.
Filed June 18, 1970, Ser. No. 47,375
Int. Cl. G01n *1/20*
U.S. Cl. 73—422 TC 5 Claims



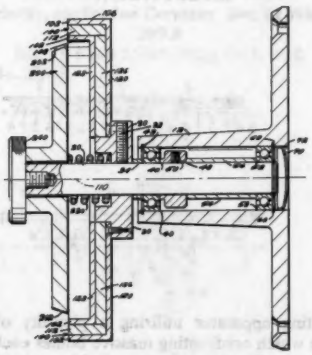
A line sampling device for obtaining product samples from a pressurized product line where the device has a chamber means having a valve seat on one end adapted to be inserted into the side of the supply line. A plunger having a poppet valve on one end is movable in the chamber and has a baffle means thereon whereby when the plunger is extended, the baffle means will be moved into the flow of product in the supply line to divert flow of product into the chamber, and when the plunger is retracted, the poppet valve will seat on the valve seat to seal the chamber from the interior of the supply line. Purge and flush lines are provided to clean the sampling chamber and to remove product therefrom and safety means are included to assure that the chamber is sealed from the purge and flush lines when open to the product line.

3,659,462
ARRESTING DEVICE FOR HEAVY OBJECTS THROWN WITH GREAT FORCE
Clyde C. Cole, 5298 Harvard, Ventura, Calif.
Filed Feb. 4, 1970, Ser. No. 8,567
Int. Cl. G01m *19/00*
U.S. Cl. 73—432 2 Claims



An energy absorbing arresting device for thrown objects of substantial weight, said device employing an assembly of spaced formed pads of deformable cushion material into which the object is forcefully ejected. Control of trapped air flow from and return of such air to the assembly, aids in preventing destructive rebound of the thrown object. In a mobile embodiment it includes a spring supported platform mounted on a vehicle whereby the entire device may be transported from place to place.

3,659,463
BALANCER
Alvin J. Karrels, Route 1, Port Washington, Wis.
Filed Dec. 26, 1967, Ser. No. 693,564
Int. Cl. G01m *1/12*
U.S. Cl. 73—480 1 Claim



A balancer for balancing lawn mower blades having a frustro-conical blade receiver on which the opening in a blade is placed, magnetic means surrounding the receiver for holding the blade on the receiver.

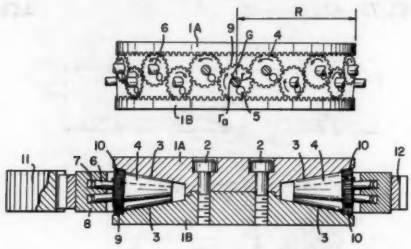
An adjustable tracking device mounted on the base of the balancer with the tip disposable adjacent the position of a blade mounted on the balancer.

3,659,464

MECHANICAL VIBRATOR

Andre Jean-Marie Puyo, and Pierre Andre Habib, both of Paris, France, assignors to James L. Sherard, Berkeley, Calif.

Filed Apr. 21, 1970, Ser. No. 30,541
Int. Cl. F16h *33/00*
U.S. Cl. 74—61 **10 Claims**



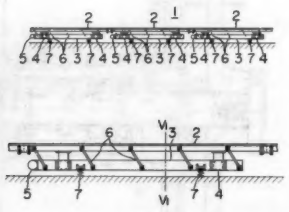
A vibrator apparatus with rotating components, comprising rolling elements in the shape of cones of revolution distributed around a construction axis with their vertices directed toward this axis and their own geometrical axes meeting this construction axis. The cones are in contact with at least one conical surface whose vertex coincides with the common point at which the vertices of the roller axes meets and centered around this construction axis. The roller cones are made to roll in contact with this conical surface to produce a rolling movement that engenders the planetary rotation of the cones and a periodic displacement of the mass of the cones parallel to the construction axis.

3,659,465

VIBRATING APPARATUS UTILIZING A PLURALITY OF VIBRATING SOURCES

Goro Oshima, and Shigeki Nishitake, both of Kitakyushu-shi, Japan, assignors to Kabushiki Kaisha Yaskawa Denki Seisakusho, Kitakyushu-shi, Japan

Filed Nov. 7, 1969, Ser. No. 874,914
Claims priority, application Japan, Nov. 9, 1968, 43/82198
Int. Cl. F16h *33/00*
U.S. Cl. 74—61 **3 Claims**



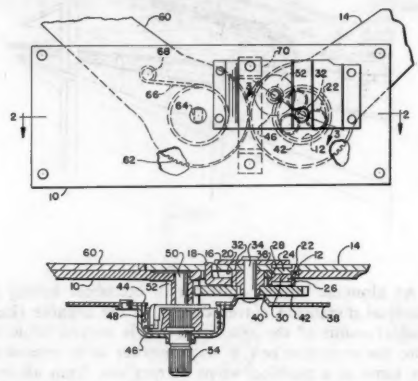
A vibrating apparatus utilizing a plurality of vibrating sources, in which confronting massive bodies each including a rotary-type vibration-applying machine are distributed, through respective resonant resilient members such as springs, onto such a vibrating body to be vibrated as a conveyer, and said machines are operated in synchronous and in phased relation, whereby an extremely long vibrating-type conveyer which has not been possible has become practical, power output capacity of the apparatus is increased, and manufacture of a vibrating-type conveyer having a desired length can be made possible by connecting a plurality of unit conveyers.

3,659,466

WINDOW REGULATOR MECHANISM

Joseph Pickles, Birmingham, Mich., assignor to Ferro Manufacturing Corporation, Detroit, Mich.

Filed May 4, 1970, Ser. No. 34,423
Int. Cl. F16h *27/02*
U.S. Cl. 74—89.18 **10 Claims**



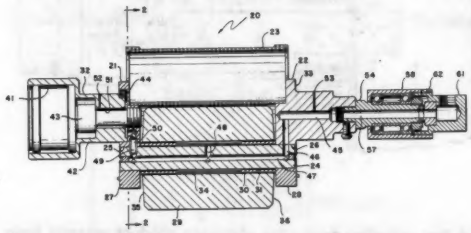
A window regulator particularly for the rear window of station wagons, comprising a mounting plate having an enlarged toothed opening forming the internal gear of a planetary gear set. A regulator arm has at one end a drive plate fixed to the arm in spaced relation. Planet gears are provided between the drive plate and arm and are rotatable thereon about fixed axes. The planet gears mesh with the internal gear and are driven by an input sun gear. Preferably, a second arm is pivoted to the mounting plate and the two arms have meshing gear sectors formed thereon.

3,659,467

ORBITING ROLLER MECHANICAL VIBRATION GENERATOR

Peter V. H. Serrell, Solana Beach, Calif., assignor to Shell Oil Company, New York, N.Y.

Filed Oct. 29, 1969, Ser. No. 872,127
Int. Cl. F01b *31/00*
U.S. Cl. 74—87 **3 Claims**



The roller of an orbiting roller vibration generator is radially retained within an internal raceway formed in the oscillator body member, and driven in rolling engagement with the raceway by a crank having four hydrodynamic bearings: two trunnion bearings concentric with the raceway and two crankpin bearings concentric with the roller; the clearances

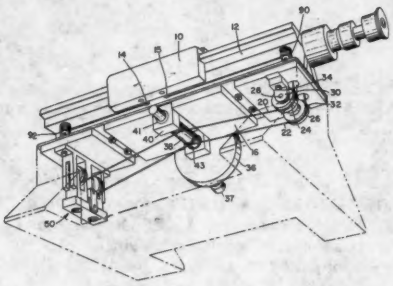
in said bearings providing the radial compliance necessary to accommodate the radial motions, due to deflections and manufacturing imperfections of the roller relative to the trunnion bearing centerline, without transferring a significant part of the roller radial load from the race to the crank bearings.

3,659,468

SLOTTED WAVEGUIDE CARRIAGE MOVEMENT APPARATUS

Andrew Alford, Winchester, and Pasquale Barbagallo, Bedford, both of Mass., assignors to said Alford, by said Barbagallo

Filed Dec. 10, 1969, Ser. No. 883,822
Int. Cl. F16h *27/02*
U.S. Cl. 74—89.22 10 Claims



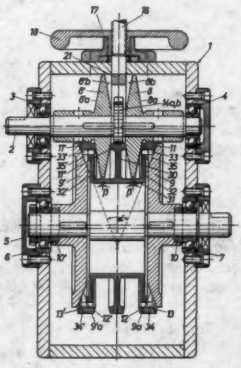
A high frequency slotted measuring waveguide has a probe carriage that is moved, by a dual-cable, pulley arrangement, along calibrated ways of the waveguide. The apparatus includes a supported lever-fulcrum arrangement adapted to equalize the tensions in both cables, thereby substantially eliminating any twisting of the carriage during its translational movement.

3,659,469

INFINITELY VARIABLE FRICTION GEARING

Karl Maichen, 12, Thalackerstrasse, Lauterach, Austria

Filed Nov. 30, 1970, Ser. No. 93,707
Claims priority, application Austria, Apr. 1, 1970, A 2988; Nov. 5, 1970, A 9961
Int. Cl. F16h *15/16*
U.S. Cl. 74—192 7 Claims



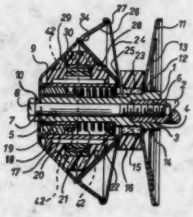
An input shaft and an output shaft carry each at least one bevel wheel. At least one of said bevel wheels is axially adjustable. A power-transmitting ring is disposed between the two bevel wheels and is in frictional contact on one side with the input-side bevel wheel and on the other side with the output-side bevel wheel.

3,659,470

VARIABLE DIAMETER CENTRIFUGAL PULLEY WITH MEANS TO VARY THE MASS OF CENTRIFUGAL WEIGHTS

Leon Beaudoin, 158 Marchand Street, Drummondville, Province of Quebec, Canada

Filed Sept. 29, 1970, Ser. No. 76,426
Int. Cl. F16h *55/52*
U.S. Cl. 74—230.17 14 Claims



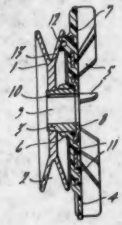
A variable diameter centrifugal pulley for use as a drive pulley in a variable speed belt and pulley transmission for snowmobiles and other vehicles, of for any machinery requiring a variable speed transmission, wherein the centrifugal weights consist of blocks provided with a cavity, closure means for said cavity, and calibrating elements removably inserted within said cavity, in order to vary the mass of the centrifugal weights, and thus adjust the rotation speed at which clutching takes place and the variation of the belt diameter on the pulley with change in the rotational speed of the pulley. The pulley also has a spring in which the increase of its resisting force is a non-linear function of the amount of its shortening so as to obtain belt declutching during engine deceleration at substantially the same rotational speed as during engine acceleration.

3,659,471

METAL PULLEY WITH DETACHABLE PLASTIC FAN

Karl Marsch, Burgermeister-Siegler-Strasse 9,6842, Burstadt, Germany

Filed Dec. 3, 1970, Ser. No. 94,885
Claims priority, application Germany, Dec. 6, 1969, P 19 61 299.8
Int. Cl. F16h *55/36*; F01p *1/02, 7/10*
U.S. Cl. 74—230.3 9 Claims



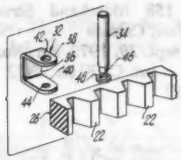
A belt pulley assembly comprises a metal pulley element which is detachably combined with a plastic fan that contains an embedded metal disk having an inner exposed rim that is slotted along with the hub of the pulley element to receive a drive key.

3,659,472

TIMING BELT ASSEMBLY

Walter Engels, New York, N.Y., assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Sept. 14, 1970, Ser. No. 72,060
Int. Cl. F16g *1/28, 13/02*
U.S. Cl. 74—231 C **9 Claims**



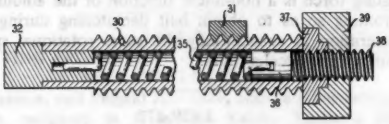
This application sets forth a timing belt assembly having an attachment fitted to the timing belt to transmit the timing belt displacement to any piece of equipment coacting with the timing belt. The displacement transmitting attachment can be used to index, actuate switches, move slides or sleeves, or any of a wide variety of other operations, in accordance with the displacement of the timing belt. The pulleys on which the timing belt is mounted include special recesses which accommodate the displacement transmitting attachment of the timing belt to assure proper seating of the attachment when that portion of the timing belt, with the attachment thereon, engages the pulleys.

3,659,473

LEAD SCREW SHAFT WITH ADJUSTABLE PITCH

Leif Rongved, Summit, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Dec. 29, 1970, Ser. No. 102,421
Int. Cl. F16h *1/18, 35/08, 55/18*
U.S. Cl. 74—424.8 R **12 Claims**



A lead screw apparatus is disclosed that permits fine adjustments to be made in the screw pitch. A lead screw shaft having N threads, an initial length L, and a spring constant K_1 is coaxially connecting to a spring having a spring constant K_2 substantially smaller than K_1. By deforming the spring by a distance δ_2, a force equal to $\delta_2 K_2$ is generated. This force is transmitted to the lead screw, producing a change in length of the screw of δ_1 where δ_1 is equal to $\delta_2 K_2/K_1$. Since K_2 is substantially smaller than K_1, δ_1 will be substantially smaller than δ_2 by the same order of magnitude. Thus a large change δ_2 in the length of the spring will change the pitch of the lead screw from N/L to $N/L \pm \pm \delta_1$.

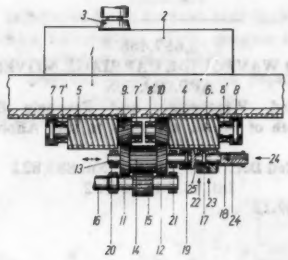
3,659,474

WORM GEAR FOR DRIVING MACHINE-TOOL SLIDES, IN PARTICULAR IN MILLING MACHINES

Heinz Neugebauer, Weidach, Germany, assignor to Werkzeugmaschinenfabrik Adolf Waldrich Coburg, Coburg Bagern, Germany

Filed July 6, 1970, Ser. No. 52,605
Claims priority, application Germany, July 11, 1969, P 19 35 428.0
Int. Cl. F16h *1/18, 55/18*
U.S. Cl. 74—424.6 **10 Claims**

Worm gear for driving machine-tool slides, in particular in milling machines, and consisting of two coaxially arranged worms meshing with a worm rack and driven by a common shaft. Each worm is separately mounted so that is is radially and axially stationary and the worms are each driven by a common axially movable compensating shaft in each case through a like pair of helical-toothed gear wheels with an equal-sized, but oppositely directed, lead angle.

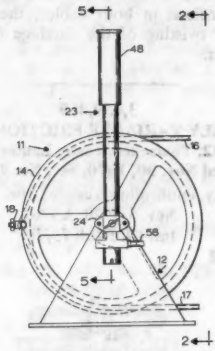


3,659,475

REMOTE THROTTLE AND STEERING CONTROL UNIT

Paul E. Nichols, Sunnyvale, Calif., assignor to Leisure Products Corporation, Menlo Park, Calif.

Filed May 28, 1970, Ser. No. 41,285
Int. Cl. G05g *13/00*
U.S. Cl. 74—480 B **2 Claims**



A remote control unit for an outboard motor or the like incorporating in a single control bar the combined functions of steering and throttle control.

3,659,476

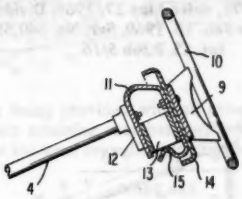
SAFETY STEERING WHEEL

Karl Wilfert, Gerlingen-Waldstadt, and Bela Barenyi, Stuttgart-Vaihingen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Original application Sept. 18, 1968, Ser. No. 760,399, now Patent No. 3,567,246. Divided and this application Oct. 2, 1970, Ser. No. 77,520
Int. Cl. B62d *1/18*
U.S. Cl. 74—492 **13 Claims**

A safety steering wheel for motor vehicles, particularly for passenger motor vehicles, in which the system "steering wheel-steering wheel spokes" is constructed relatively form-

rigid and is arranged at the upper end of a steering column by the interposition of a yielding intermediate structure which is constituted by an elastically yielding transmission



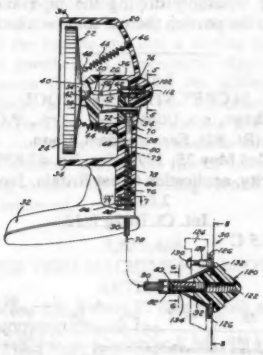
member yielding in the direction of the steering column, and an energy-dissipating element is associated with this transmission member.

3,659,477

REMOTE CONTROL MIRROR AND CONTROL MECHANISM THEREFORE

William C. Wehner, 14891 Grandville, Detroit, Mich.

Filed Apr. 16, 1970, Ser. No. 29,195
Int. Cl. F16c *1/12*
U.S. Cl. 74—501 M **12 Claims**



A remotely controlled mirror, such as a vehicle rear view mirror, including a pivotally supported mirror member, a rotatable linkage system and a drive mechanism. The linkage system includes at least two pivotally connected link members; the first link member operably connected to the mirror member at a fixed acute angle relative to the reflective surface, and the second link member drivably connected to the first link member at a variable angle. The drive mechanism is adapted to rotate the linkage system, adjusting the position of the mirror relative to the vertical and horizontal axes, and shift the distal end of the second link member toward the mirror, adjusting the angle of inclination of the mirror relative to the axis perpendicular to the mirror.

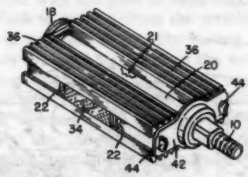
3,659,478

REFLECTOR PEDAL FOR CYCLES

Carlton P. Pawsat, and Robert F. Humlong, both of Maysville, Ky., assignors to Wald Manufacturing Company, Inc., Maysville, Ky.

Filed Mar. 23, 1970, Ser. No. 21,656
Int. Cl. G05g *1/14*
U.S. Cl. 74—594.4 **6 Claims**

The pedal frame comprises a pair of spaced parallel legs onto each of which is telescoped an elongate extruded pedal block having formed therein an open-ended tubular passageway receptive of a frame leg, and an open-face open-ended channel slidingly receptive of a reflector element, said



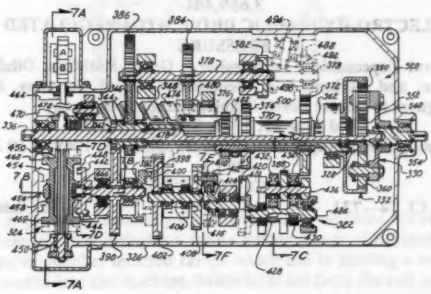
channel and said leg including simple detent means for obstructing shifting of the reflector element lengthwise of the channel.

3,659,479

POSITIVE CONTINUOUSLY CONSTANT GEAR-MESH SPEED CHANGE SYSTEM FOR PLANETARY DRIVE SYSTEMS AND THE LIKE

Laszlo J. Kiss, 7044 Paige, Warren, Mich.

Filed Jan. 9, 1970, Ser. No. 1,823
Int. Cl. F16h *37/04, 3/78*
U.S. Cl. 74—681 **47 Claims**



A planetary gear speed change system including a ratio alternater system and an automatic mechanical shifter system operable to shift ratio alternater elements into driving engagement with the planetary reaction member, vary its relative rotational value and then disengage, in automatic synchronous timed relation to the ratio alternater system functional cycles, with continuous drive during such shifting, to thereby vary the planetary driving ratios with continuous torque delivery throughout its operation, and including constant speed and/or fixed members synchronously engageable with the reaction member to maintain same at selected rotational values. Modifications include single, multiple and other combinations of planetary drive systems. Various novel synchronized shifter and ratio alternater systems are disclosed, as are novel combinations for effecting many varieties of driving conditions and speed change applications.

3,659,480

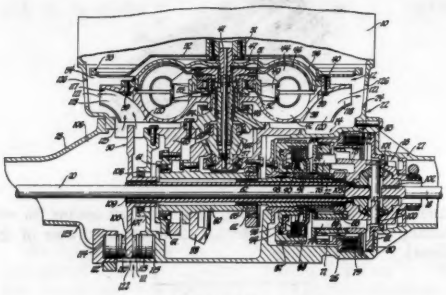
VEHICLE POWER TRAIN

Erkki A. Koivunen, Livonia, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 6, 1970, Ser. No. 52,544
Int. Cl. F16h *37/08, 47/08, 57/04*
U.S. Cl. 74—695 **3 Claims**

A vehicle power train having an engine, a transmission including a torque converter driven by the engine, differential

gearing connecting the transmission to the vehicle's drive axle shafts, a brake connected to brake the input to the differential gearing to brake the drive axle shafts and a fan driven by the input of the transmission circulating air to cool the brake, the torque converter and the engine.



3,659,481

ELECTRO-HYDRAULIC DRIVE WITH REGULATED PRESSURE

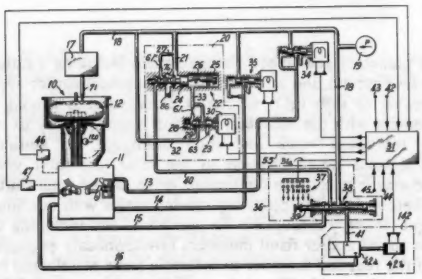
Helmut Espenschied, Ludwigsburg; Georg Rothfuss, Ditzingen, and Gerhard Will, Beutelsbach, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed June 25, 1970, Ser. No. 49,844

Claims priority, application Germany, June 28, 1969, P 19 32 986.3

Int. Cl. F16h *47/00*

U.S. Cl. 74—731 **10 Claims**



A planetary hydraulic transmission is shifted between different stages by hydraulic operating means which receive pressure fluid whose pressure is adjusted by pressure regulating means which respond to control signals transmitted by an electronic control apparatus. The control signals represent a desired drive torque determined by the electronic control apparatus from signals received from means sensing various operational conditions of the drive motor of a car driven by the drive motor through the transmission. Since the regulated pressure is proportional to the drive torque, load peaks are prevented during shifting of the transmission.

3,659,482

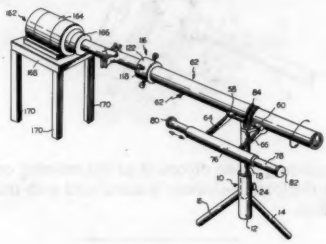
METHOD OF REAMING A ROTATING PIPE

Donald E. Blake, 761 Chestnut Ridge Road, Morgantown, W. Va.

Original application Sept. 3, 1967, Ser. No. 627,694, now Patent No. 3,445,871, dated May 27, 1969. Divided and this application Feb. 18, 1969, Ser. No. 840,550

Int. Cl. B26b *5/16*

U.S. Cl. 408—1 **1 Claim**



A method is provided for the reaming of pipes wherein a portable rotary power source such as a power vise may be employed to rotatably drive the pipe. The method involves establishing a universal driving connection between a pipe to be worked and a rotary power source, rotatably securing the pipe in a vise means supported for rotation about multiple axes, and then rotatably driving the pipe and applying a reaming tool to the portion thereof to be worked.

3,659,483

JACKET STRIPPING TOOL

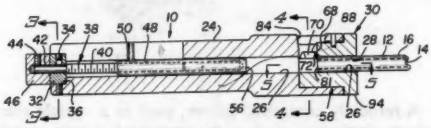
James J. Matthews, c/o Utility Tool Corp., P.O. Drawer B, Town Street (Rt. 82), East Haddam, Conn.

Filed May 25, 1970, Ser. No. 40,039

Claims priority, application Great Britain, Jan. 15, 1970, 2,081/70

Int. Cl. H02g *1/12*

U.S. Cl. 81—9.5 C **4 Claims**



A cable jacket stripping tool including a cutting member having a cutting edge and lifting ramp so arranged that, during a cutting interval, the cutting edge functions in a clearance position from the cable core to initiate cutting removal of the major portion of the jacket surrounding the core and the lifting ramp completes this removal by causing rupture of the remaining uncut jacket portion. Thus, complete jacket removal is achieved with a cutting edge sufficiently spaced from the cable core to obviate inadvertent nicking thereof.

3,659,484

REVERSIBLE RATCHET WRENCH WITH INTERLOCKED ASSEMBLY

Gino L. Scodeller, 5518 Vallego Street, Oakland, Calif.

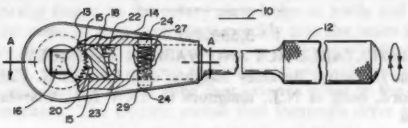
Filed June 18, 1970, Ser. No. 47,374

Int. Cl. B25b *13/46*

U.S. Cl. 81—63 **20 Claims**

A reversible wrench with a ratchet and pawl mounted in respective apertures of a one-piece head and held in the head by a common retaining member. In one form, the head has a

movable handle attached to it, the position of the handle relative to the head determining the ratchet drive direction,



the handle being provided with an extension which acts as the common retaining member and holds the ratchet and pawl within the head regardless of handle position.

3,659,485

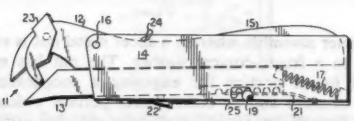
ADJUSTABLE OPEN END RATCHET WRENCH

Albert Roth, 6248 Rockhurst Drive, San Diego, Calif.

Filed Sept. 2, 1970, Ser. No. 69,021

Int. Cl. B25b *13/28, 13/12, 13/18*

U.S. Cl. 81—98 **9 Claims**



An adjustable open end ratchet wrench having one jaw member pivotally attached to a handle and a second jaw member slidably received by the handle juxtaposed the pivotal jaw member; the sliding jaw member being spring-biased out of the handle and into a closing relationship with the fixed jaw member; an incremental adjusting mechanism coupled between the handle and the sliding jaw whereby when the handle is rotated in one direction, the adjusting mechanism latches and locks the slidable jaw with respect to the fixed jaw and when rotated in another direction, releases allowing the slidable jaw to be forced inward against the spring biasing means for ratcheting around a nut being tightened or loosened.

3,659,486

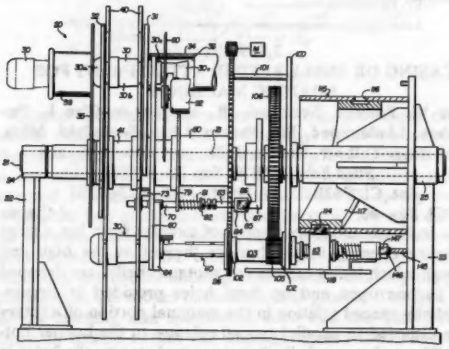
HIGH SPEED TRIM MACHINE FOR BLOWN PLASTIC ARTICLES

Donald H. Criss, and Robert F. Kontz, both of Toledo, Ohio, assignors to Owens-Illinois, Inc.

Filed Mar. 9, 1970, Ser. No. 17,824

Int. Cl. B23b *5/14, 1/00*

U.S. Cl. 82—82 **18 Claims**



This disclosure proposes a method and apparatus for removing integral flash from a blown plastic article. The articles are serially fed to and retained in pockets formed at the peripheries of continuously rotating, axially spaced plates, the article flash portions projecting laterally beyond the plates. The articles are cammed into and out of the retention pockets, and a cam actuated locking mechanism is utilized to retain the articles in the pockets against movement relative to the plates. An individual flash-severing mechanism advances into contact with the flash of each article and rotates relative to the flash to sever it from the article. In the event that the article is a bottle or the like having a flash which completely closes the neck or finish of the bottle, an initial flash severing is accomplished to open the end of the finish prior to advancement of the individual flash-severing mechanism. The mechanism is entirely mechanically actuated by cams and the like, and no limit switches or other sequence-controlling mechanism are necessary.

3,659,487

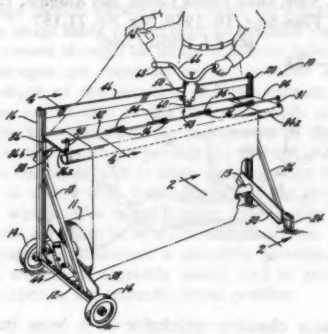
PORTABLE MANUALLY OPERABLE CUTTING MACHINE FOR ROLLED SHEET MATERIAL

Charles A. Henderson, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Mar. 30, 1970, Ser. No. 23,606

Int. Cl. B26d *1/20*

U.S. Cl. 83—447 **9 Claims**



A portable, manually operable, cutting machine for rolled sheet material includes a frame having a pair of horizontally spaced parallel inclined ramps which aid in loading a roll of material into the machine. Material is fed from the roll over a shelf having a cutter backing bar, and is held in position by friction brushes. A cutting carriage, with a rotatable disk cutter, is rocked downward into contact with the backing bar to cut the material when the carriage is moved across the shelf.

3,659,488

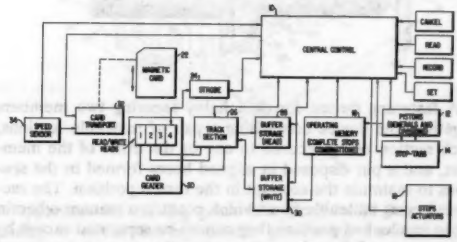
CAPTURE COMBINATION SYSTEM

Ralph Deutsch, Sherman Oaks, Calif., assignor to North American Rockwell Corporation, Anaheim, Calif.

Filed Oct. 9, 1970, Ser. No. 79,614

Int. Cl. G10b *3/10*

U.S. Cl. 84—345 **16 Claims**



A capture combination system for use in an electronic organ provides rapid reprogramming of the entire combina-

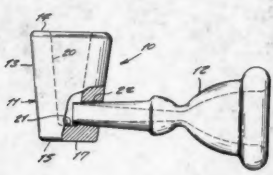
tion memory while permitting manual selection of desired stop combinations at any time. Desired stop combinations are selected for each piston and set into the working memory of the system. These combinations, upon command, are transferred from the working memory to a storage or external memory. A full combination of stop settings may be stored on the external memory by transfer from the internal memory, and a number of such external memories corresponding to a number of different full combinations of stop settings thus may be prepared and, subsequently, selectively presented to the system as desired. The combination settings from the external memory are transferred upon command into the internal working memory for establishing the desired combination of stop settings therein. Transfer into or out of the external memory requires but a few seconds. Whenever desired, the working memory may be altered to modify one or more stop combinations, whether set manually, or entered therein from the external memory and, in the latter case, while retaining the combinations recorded in the external memory.

3,659,489

BRASS-INSTRUMENT-PRACTICE DEVICE

Raymond J. Vale, 6006 Forest Ledge, San Antonio, Tex.

Filed Sept. 10, 1970, Ser. No. 71,157
Int. Cl. G09b *15/06*
U.S. Cl. 84—465 **1 Claim**



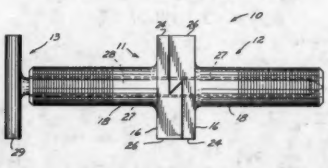
A resonator chamber attachable to a brass instrument mouthpiece so as to buffer the buzzing sound produced by the brass instrument mouthpiece, the device comprising a barrel which is a singular part of generally bowl-shape with a central chamber that opens out upon one end of the barrel, the inner end of the chamber communicating with the terminal end of the brass instrument mouthpiece.

3,659,490

FASTENING DEVICE

Harold G. Buck, 2302 Dawes St., Ashland, Nebr.

Filed Aug. 27, 1969, Ser. No. 853,391
Int. Cl. F16b *35/00*
U.S. Cl. 85—1 R **4 Claims**



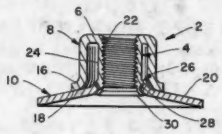
A fastening device for detachably securing two members together, the device comprising a pair of mateable sections, each section being secured to one or the other of the members, and a pin disposed in aligned bores formed in the sections to maintain the sections in the mated position. The sections having mateable faces which coact in a manner wherein when in a locked position they cannot be separated except by moving one of them away from the other in a plane normal to the plane in which the stresses or impacts under use occur, and the pin removably mounted in the aligned bore to prevent movement of one section relative to the other section.

3,659,491

ROTATABLE NUT AND WASHER ASSEMBLY

William B. Duffy, Berkeley Heights, and Charles K. Fisher, Belford, both of N.J., assignors to TRW Inc., Cleveland, Ohio

Filed Mar. 8, 1971, Ser. No. 121,636
Int. Cl. F16b *37/02, 43/00*
U.S. Cl. 85—32 **14 Claims**



A fastener assembly wherein a sheet metal nut is rotatably coupled to a frusto-conical washer. The nut has an inner threaded barrel portion for engaging a cooperating male fastener element and an outer barrel portion which is particularly shaped for engagement by a tool for rotating the nut. The inner barrel portion is spacedly nested within the outer barrel portion and the respective barrel portions are joined at the upper end of the nut. The lower end of the inner barrel portion extends through a central aperture in the washer and is loosely curled under the edge of the aperture to provide a retaining collar. Adjacent the lower end of the inner barrel portion and the retaining collar, the inner barrel portion carries a peripheral bearing ring having a smooth undersurface lying at a selected acute angle to the longitudinal axis of the nut. The bearing ring is formed from metal skived from the outer wall of the inner barrel portion and compacted into the said ring configuration. The washer embodies a cylindrical lip projecting from its upper surface adjacent the aperture therein, and said lip has a smooth inboard surface which is complementary to and confronts the undersurface of the bearing ring on the nut. The outer barrel portion of the nut also includes a peripheral skirt at its lower end which rotatably bears on the adjacent convex face of the washer. The nut and washer components are free spinning with respect to each other and the said fastener assembly provides for a markedly improved torque-tensile relationship when the nut is turned onto a male fastener element and the washer is tightened against the confronting surface of an apertured member through which the male element protrudes.

3,659,492

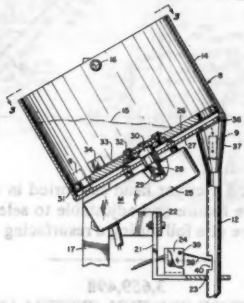
CASING OR SHELL FEEDER ATTACHMENT FOR LOADING MACHINES

Roger W. Fullmer, Rockford, Ill., assignor to Glen L. Dunahoo, Lindenwood, Ill.; Nathan Adler, Southfield, Mich. and Roger Fullmer, Rockford, Ill., part interest to each

Filed Feb. 9, 1970, Ser. No. 9,805
Int. Cl. F42b *33/14;* **G07f** *11/28;* **B23g** *7/02*
U.S. Cl. 86—46 **4 Claims**

An inclined stationary hopper of circular form has a large discharge opening in the bottom thereof at the high end through which bullet casings (or shotgun shells) are dropped one by one open end up from holes provided in circumferentially spaced relation in the marginal portion of a rotary plate disposed in parallel spaced relation to the hopper bottom. The casings or shells drop open end up into the holes in the plate from a supply piled on top of the rotary plate in the low end of the hopper and are carried around to the discharge opening to be dropped, the open end up disposi-

tion of the casings or shells in the holes being assured because their closed flanged ends are appreciably heavier. Stirring of the casings or shells in the pile by an upwardly projecting finger on the rotary plate helps to jostle and tumble the same so they drop more quickly into the holes in the rotary plate. A funnel, disposed under the hopper's discharge opening, guides the casings or shells open end up into a substantially vertical feeder tube that extends down to the loading machine. The electric motor that transmits drive to the



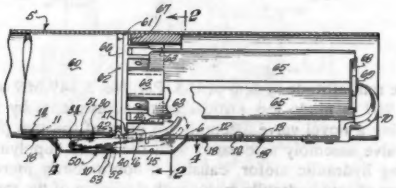
rotary plate through suitable reduction gearing is controlled by a switch operated by a feeler finger that extends through a slot in one side of the feeder tube near its upper end and is spring pressed normally upwardly to closed circuit position but arranged to be held down in open circuit position but arranged to be held down in open circuit position by one or more casings or shells to stop the motor when a pileup occurs in the tube due to the casings or shells not being processed as fast as they are being dropped into the feeder tube.

3,659,493

ROCKET RETAINING MECHANISM FOR LAUNCHER TUBES

Irving E. Wissner, Santa Monica, Calif., assignor to Hitco, Los Angeles, Calif.

Filed Jan. 16, 1970, Ser. No. 3,346
Int. Cl. F41f *3/04*
U.S. Cl. 89—1.807 **8 Claims**



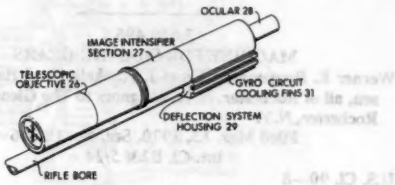
Rocket launcher-tube rocket retaining mechanism of the detent type for rockets with a latching rim having a circumferential groove and foldable stabilizing fins. A latching arm is rotatably mounted at one of its ends to a mounting plate secured over an opening in the tube sidewall, spring means urging the free end of the arm into the tube. The arm defines an inwardly extending latching tab spaced forward of a rear stop projection on the mounting plate, this space accommodating the rocket latching rim with the latching tab projecting into the rocket circumferential groove. The free end of the latching arm is oriented such that the blast issuing from an ignited rocket will impinge against it and rotate it radially outward to withdraw the latching tab from the rocket circumferential groove and free the rocket for forward flight. The shape of the latching tab provides positive latching, a forward movement tendency of the rocket causing an increase in the latching force due to an over-center action.

3,659,494

FIRE CONTROL SYSTEM FOR USE IN CONJUNCTION WITH ELECTRONIC IMAGE MOTION STABILIZATION SYSTEMS

Richard W. Philbrick, Concord, and Efraim R. Arazi, Cambridge, both of Mass., assignors to Itek Corporation, Lexington, Mass.

Original application June 8, 1965, Ser. No. 462,322, now Patent No. 3,515,881, dated June 2, 1970. Divided and this application July 31, 1969, Ser. No. 848,763
Int. Cl. F41c *19/12*; F41f *13/08*
U.S. Cl. 89—28 **12 Claims**



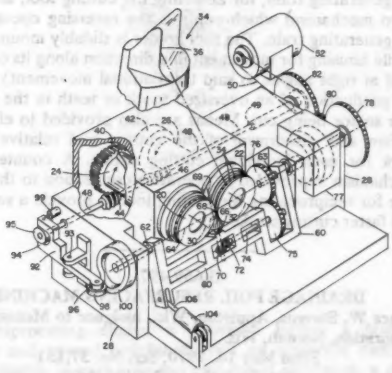
An image motion stabilization system for eliminating motion of an image being viewed from an unstable support. The image is viewed through an image converter tube. X and Y rate gyroscopes are mounted on the unstable support to sense motions of the support, and the outputs from the gyroscopes are applied to the deflection coils of the converter tube to compensate for movements of the support. Panning control means are provided to prevent image deflection in the converter tube to allow panning when the support is moved at a slow rate. Embodiments of the invention are disclosed wherein the image motion stabilization system is utilized with a camera or in a fire control system. In the fire control system embodiment a circuit is provided to sense when the weapon is correctly aimed, and to automatically fire the weapon in the correctly aimed position.

3,659,495

GEAR MAKING

Paul Maker, Marion, Mass., assignor to Bird Island, Inc., Boston, Mass.

Filed Aug. 25, 1970, Ser. No. 66,739
Int. Cl. B23f *5/20*
U.S. Cl. 90—3 **7 Claims**



Apparatus for making gears of hyperboloidal form, comprising a cutter having profile generating cutting edges mounted for movement about a common axis, and a support for a workpiece rotatable about a workpiece axis; the support and the cutter being mounted for relative pivotal movement

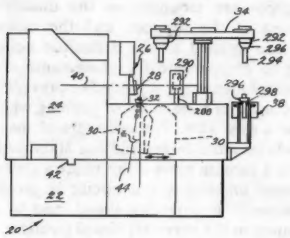
about a feed axis nonparallel to the workpiece axis; the support and the cutter having basic rates of simultaneous movement about the workpiece and cutter axes, respectively, in the absence of the pivotal movement, in ratio dependent upon the number of cutting edges to the number of teeth in the gear, to cause continuous indexing of the workpiece as the cutting edges make successive cuts adjacent the profiles; the support and the cutter being mounted so that one of the basic rates is increased or decreased, upon occurrence of the pivotal movement, by a differential rate dependent upon the angular rate of the pivotal movement, so that successive cuts adjacent each tooth profile will follow the desired contour thereof.

3,659,496

MACHINE FOR SHAPING GEARS

Werner E. Bergemann; Ernst J. Hunkeler, and Harry Pedersen, all of Rochester, N.Y., assignors to The Gleason Works, Rochester, N.Y.

Filed Mar. 13, 1970, Ser. No. 19,346
Int. Cl. B23f *5/14*
U.S. Cl. 90—8 **20 Claims**



A gear shaping machine for cutting gears with generation effected by a rotatable work holder and a tool holder carrying a cutting tool adapted to be reciprocated. The tool holder is mounted to a translatable supporting structure, the rate or speed of such translational movement during generation being selectively variable to produce variable ratio gears. Separate and independent power sources are provided for the generating train, for actuating the cutting tool, and for a servo mechanism which controls the reversing operation of the generating train. The tool holder is slidably mounted in a cradle housing for movement in a direction along its own axis (and at right angles to said translational movement) to permit production of an oversized tooth or teeth in the gear or gear sector being cut. Means are also provided to effect insertion and withdrawal of the cutting tool relative to the work for each individual cutting stroke. A counterweight mechanism is provided in operative connection to the structure for reciprocating the cutting tool to provide a smoother and faster cutting stroke.

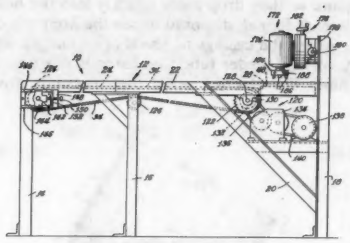
3,659,497

DRAINAGE FOIL RESURFACING MACHINE

Bruce W. Stevens, Appleton, Wis., assignor to Menasha Corporation, Neenah, Wis.

Filed May 14, 1970, Ser. No. 37,151
Int. Cl. B23c *1/12, 9/00, 3/00*
U.S. Cl. 90—17 **11 Claims**

Apparatus for resurfacing upper surface portions of drainage foils which have lower longitudinally extending dovetail configurations or the like, including a support table having a guide fixture thereon adapted to cooperate with the lower dovetail portion of a foil in guiding relation therewith, an endless chain supported for cooperation with an end of a foil for effecting longitudinal movement thereof through the



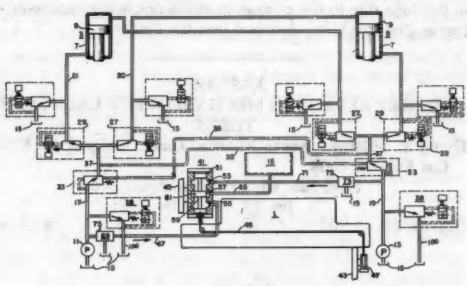
guide fixture, and a cutter head supported in overlying relation to the guide fixture and adjustable to selectively engage the upper surface of a foil during a resurfacing operation.

3,659,498

RAM ATTITUDE CONTROL SYSTEM AND VALVE ASSEMBLY THEREFOR

Rolland A. Richardson, Alameda, Calif., assignor to Pacific Press & Shear Corp.

Filed Aug. 13, 1970, Ser. No. 63,530
Int. Cl. F01b *25/04;* **F15b** *11/22*
U.S. Cl. 91—171 **5 Claims**



The ram attitude system of U.S. Pat. No. 3,349,669 of Oct. 31, 1967 is made less critical as to adjustments by incorporating a novel valve assembly for each of the two pumps, the valve assembly associated with the pump supplying the leading hydraulic motor, causing a continuously increasing by-pass of said hydraulic motor with deviation of the ram of a machine, to set up corresponding corrective forces in a nonproportional manner but with no sharp changes in such corrective forces.

3,659,499

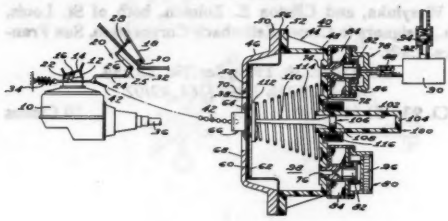
VACUUM MOTOR ADAPTED FOR USE IN A VEHICLE SPEED CONTROL MECHANISM

Gary F. Woodward, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Original application Dec. 4, 1968, Ser. No. 781,170, now Patent No. 3,572,214. Divided and this application Oct. 2, 1970, Ser. No. 77,501
Int. Cl. F15b *13/044, 13/16*
U.S. Cl. 91—454 **2 Claims**

A vacuum motor which is especially adapted for use in a speed control mechanism for an automotive vehicle in which

a flexible diaphragm is positioned in the housing of the motor and cooperates with the housing to form a chamber. Means are provided communicating with the chamber and the flexible diaphragm for applying a varying pressure to the chamber and hence the diaphragm so that the diaphragm is moved as a function of the pressure applied thereto. The diaphragm is adapted to be connected to a movable controller means for



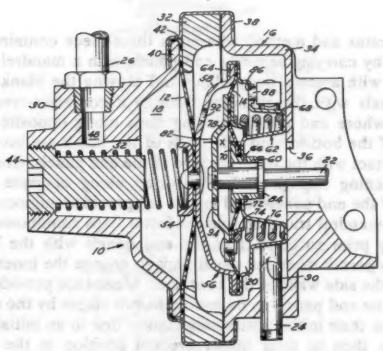
controlling the speed of the vehicle in accordance with the position of the diaphragm. Movable means are coupled to the diaphragm and are positioned within the chamber. The vacuum motor includes electrical circuit means and said movable means cooperates with the electrical circuit means for varying the value of a parameter of the electrical circuit means as a function of the position of the diaphragm and the movable means.

3,659,500

DUAL DIAPHRAGM VACUUM SERVO

Ahmet Reisi Akman, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Feb. 2, 1970, Ser. No. 7,491
Int. Cl. F01b *19/02*
U.S. Cl. 92—49 **2 Claims**



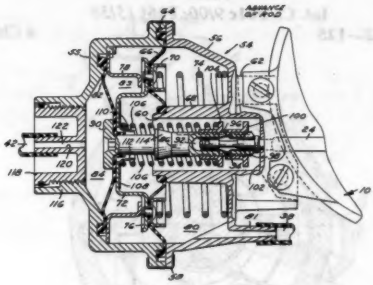
A vacuum servo construction having two flexible diaphragms in a single housing, with one connected to the other for a limited relative movement between the two, and the movement of one being modulated by changes in the vacuum levels. One of the diaphragms supports a carrier which houses the second diaphragm and, of which the following is a specification.

3,659,501

MULTI-DIAPHRAGM VACUUM SERVO

Garry E. Beard, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 3, 1970, Ser. No. 16,163
Int. Cl. F01b *19/00*; F02p *5/04*
U.S. Cl. 92—49 **9 Claims**



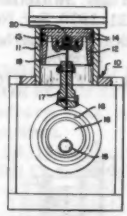
A vacuum controlled servo has two axially spaced flexible diaphragms each defining separate vacuum chambers, one diaphragm being connected to an actuator; the diaphragms are spring biased with the springs in parallel arrangement and one operatively located between the two; a number of adjustable stops permit varying actions of the diaphragms to vary and modulate the movement of the actuator as a function of the changes in pressure in the separate chambers.

3,659,502

RECIPROCATING ENGINES

Milton I. Friedman, 2120 Hillholm St., and Theodore Kordell, RD. 4, Box 180-D, both of Johnstown, Pa.

Filed Aug. 28, 1970, Ser. No. 67,952
Int. Cl. F16j *1/14*
U.S. Cl. 92—84 **8 Claims**



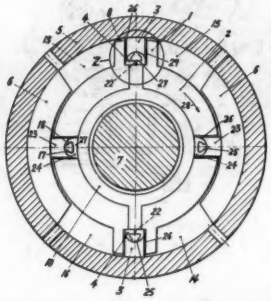
A reciprocating engine is provided having a hollow cylinder and spaced crankshaft with an eccentric cam, a piston slidable in said cylinder with radial clearance, a plurality of spaced annular grooves around the piston circumference, a ring of resin having a low coefficient of friction in each said groove between the piston and cylinder, a connecting rod connected at one end to said crankshaft through a prelubricated anti-friction bearing and at the other end to the piston by a deflectable member capable of angular deflection.

3,659,503

HYDRAULIC ROTARY-BLADE PIVOT DRIVE FOR HYDRO-STABILIZERS AND RUDDER SYSTEMS

Heinz-Gunter Ehluss, Tornesch, and Erich Wessel, Hamburg, both of Germany, assignors to Howaldtswerke-Deutsche Werft Aktiengesellschaft Hamburg und Kell, Hamburg, Germany

Filed May 8, 1970, Ser. No. 35,709
Claims priority, application Germany, July 4, 1969, P 19 33 963.0
Int. Cl. F01c *9/00*; F16j *15/38*
U.S. Cl. 92—125 4 Claims



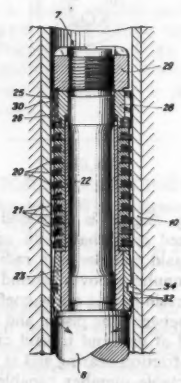
A hydraulic rotary-blade pivot drive for hydro-stabilizers and rudder systems, particularly on ships, with receiving grooves on the external sides of the rotor blades and/or the inside of the stator blades, and with sealing strips and elastic elements which are radially displaceable in said receiving grooves. Slave blades are provided between the sealing strips and the elastic elements over the entire length of the rotor. The slave blades are held in the receiving grooves with clearance so as to be radially displaceable and project beyond the outsides of the rotor blades and the insides of the stator blades and are designed to ensure hermeticity on all sides. The sealing strips together with the slave blades and the elastic element form one single sealing unit.

3,659,504

MEANS FOR SPACING A PISTON FROM A CYLINDER DURING OPERATION

Alfred Zurcher, Winterthur, Switzerland, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland

Filed Apr. 21, 1970, Ser. No. 30,416
Claims priority, application Switzerland, Apr. 24, 1969, 6228/69
Int. Cl. F16h *33/10*
U.S. Cl. 92—162 6 Claims



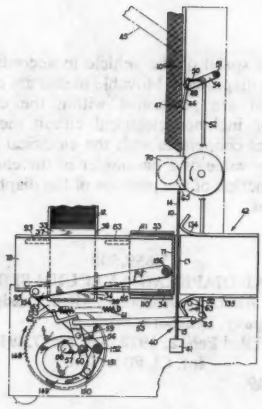
The piston is provided with helical grooves in a surface facing the cylinder wall so as to impart a swirl to the heated gas escaping between the piston and cylinder from the compression chamber. The grooves are formed near the piston rod so as to obtain a uniform heating of the piston rod rather than an unbalanced heating which could cause the piston to scrape against the cylinder wall during reciprocation.

3,659,505

APPARATUS AND METHOD FOR ERECTING CONTAINERS

Paul Wasyluka, and Clinton E. Zolman, both of St. Louis, Mo., assignors to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Mar. 30, 1970, Ser. No. 23,654
Int. Cl. B31b *1/30*, *1/44*, *49/02*
U.S. Cl. 93—51 M 10 Claims



Apparatus and method wherein a three-piece container is erected by carrying separate end panels with a mandrel into contact with a main body blank and moving the blank and end panels with the mandrel through a container-erecting station where end panel-engaging flaps along opposite end edges of the bottom and side walls of the blank are brought into contact with the outer surface of the end panels. Corner-strengthening flaps are also provided along opposite side edges of the end panels, and means are provided adjacent the path of mandrel travel to fold the latter flaps simultaneously inwardly prior to contact of the end panels with the body blank to permit such end panel flaps to engage the inner surface of the side walls of the container. Means are provided to permit the end panels to be moved in two stages by the mandrel from their initial positioning station first to an initial rest position, then to their finally erected position in the container.

3,659,506

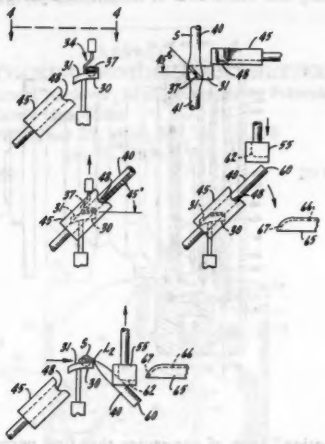
MACHINE FOR FORMING STRAWS

Justin M. Schmitt, Pompano Beach, Fla., assignor to Jeno's, Inc., Duluth, Minn.

Filed Nov. 27, 1970, Ser. No. 93,081
Int. Cl. B31d *5/04*; B31c *11/02*; B31b *45/00*
U.S. Cl. 93—84 TW 9 Claims

A machine for folding straws to temporarily alter a straw's configuration, shorten it and form a liquid-tight seal in the

straw. The straw is positioned against an anvil and a hammer creases it on a crease line oblique to the straw's axis. A pair of die elements moving transversely of the straw folds an



upper section about this crease line and a second crease line into perpendicular relationship with a lower straw section while forming a liquid-tight seal at the folds.

3,659,507

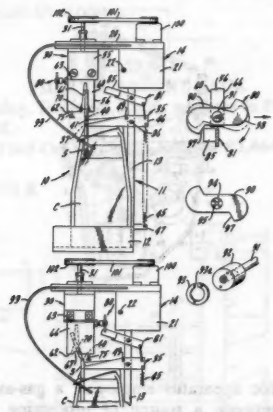
MACHINE FOR FORMING STRAWS

Robert D. Cushman, Fort Lauderdale, Fla., assignor to Jeno's, Inc., Duluth, Minn.

Filed Nov. 27, 1970, Ser. No. 93,082

Int. Cl. B31d *5/04*; B31c *11/02*; B31b *45/00*

U.S. Cl. 93—84 TW **13 Claims**



A machine for folding straws to temporarily alter a straw's configuration, shorten it and form a liquid-tight seal in the straw. A rotating chuck folds the straw over anvil surfaces to form two crease lines in the straw. The chuck folds an upper straw section on these crease lines into perpendicular relationship with a lower straw section while forming a liquid tight seal at the folds.

3,659,508

FLASH-SYNCHRONIZING ASSEMBLY FOR CAMERAS

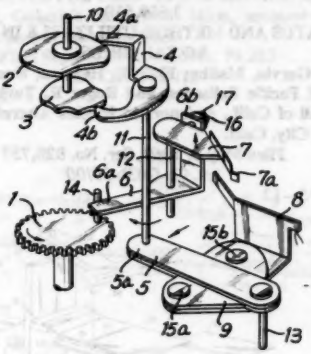
Fumio Urano, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed May 13, 1970, Ser. No.

Claims priority, application Japan, June 10, 1969, 44/53769

Int. Cl. G03b *9/70*

U.S. Cl. 95—11.5 R **2 Claims**



A flash-synchronizing assembly for cameras, enabling the instant of flash ignition to be selected according to the type of flash and the shutter speed. A pair of coaxial cams are provided to be selectively positioned angularly respectively according to positions corresponding to the type of flash and to the shutter speed. A cam follower is swingable on a rod carried by a swing-lever which turns about a given axis. This cam follower engages both of the cams to determine from the latter the angular position of the swing-lever, so that this latter position will be in accordance with the selected combination of flash type and shutter speed. A normally stationary contact of a flash circuit is carried by the swing-lever to be positioned as a location determined by the combined positions of the cams. A movable contact is released, upon initiation of an exposure, for movement into engagment with the normally stationary contact so as to bring about closing of the flash circuit at an instant which will be best for the particular type of flash and shutter speed which have been selected.

3,659,509

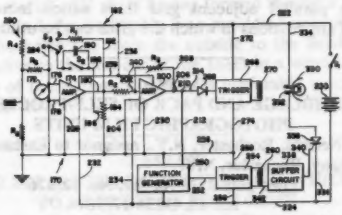
EXPOSURE CONTROL SYSTEM WITH AUTOMATIC ADJUSTMENT FOR FLASH SYNCHRONIZATION

John P. Burgarella, Sudbury, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed July 24, 1969, Ser. No. 844,501

Int. Cl. G03b *9/70*

U.S. Cl. 95—11.5 R **14 Claims**



An exposure control system incorporating an improved flash synchronization arrangement. The timing of the initiation of flash illumination relative to an exposure interval is

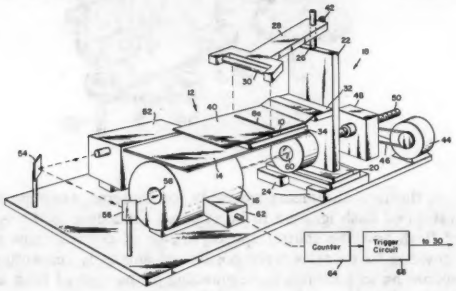
controlled to substantially equate the quantity of scene light entering the aperture of a photographic apparatus during an exposure interval initiating period with the quantity of light entering the aperture during the corresponding period required for terminating an exposure interval. In a preferred embodiment the dynamic characteristics of a flash lamp are adjusted by follow-focus means to normalize the amount of light reaching the film plane of a camera.

3,659,510

APPARATUS AND METHOD UTILIZABLE IN FORMING METAL GRIDS

Hugh L. Garvin, Malibu; Elvin E. Herman; Russell R. Law, both of Pacific Palisades, and Roger R. Turk, Woodland Hills, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 1, 1969, Ser. No. 820,737
Int. Cl. G03b *29/00*
U.S. Cl. 95—12 **6 Claims**



Apparatus and method for forming metal grids. The apparatus includes a support, carriage, photomask, photolamp, and interferometer. A photographic plate is positioned on the support and the photomask is attached to the carriage which is translated to thereby carry the photomask across the photographic plate. The interferometer allows repetitive exposure of the plate by the photolamp via the photomask by measuring the position of the carriage and by controlling a photolamp trigger circuit for flashing the photolamp when predetermined carriage positions are sensed by the interferometer. The photomask contains a single slit through which light rays from the photolamp pass whereby the successive flashing of the photolamp is operative to form a pattern of parallel, closely spaced image patterns in the photographic plate. The thus exposed photographic plate is developed and the resultant photographic master is replicated in a sequence of steps resulting in the formation of a metal grid on a target substrate. Salient features of the apparatus and method contribute to the successful provision of metal grids characterized by substantially uniform spacing between parallel adjacent grid lines which increases the range of applications in which the grids can be utilized.

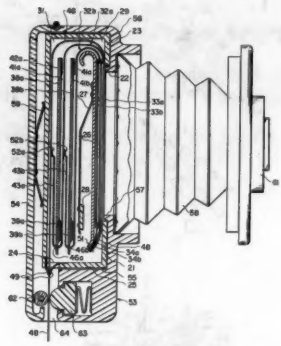
3,659,511

ASSEMBLAGE AND PACK OF SELF-PROCESSING PHOTOGRAPHIC FILM UNITS

Hubert Nerwin, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed July 2, 1970, Ser. No. 52,026
Int. Cl. G03b *17/50*
U.S. Cl. 95—13 **11 Claims**

A film-assemblage and pack containing a plurality of self-processing film units adapted to be exposed and processed in sequence. Each film unit includes a first or photosensitive sheet and a second or process sheet, which sheets are separated during exposure and are brought into superposition for removal from the camera and for processing. The film units are connected within the assemblage or pack by an arrangement of leaders, only one of which is accessible from the camera exterior after each exposure. Superpositioning, processing and withdrawal of the sheets is effected through a



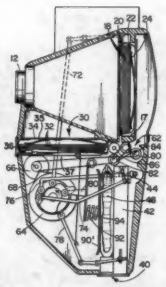
"lost-motion" type of connector that first permits and then prevents relative movement between the sheets as a respective leader is withdrawn from the camera. Simultaneously with such withdrawal, the leader associated with the next successive film unit automatically is brought into the position where it will be accessible from the camera exterior for the next exposure and processing sequence.

3,659,512

PHOTOGRAPHIC APPARATUS AND PROCESS EMPLOYING POROUS FILTER

Milton S. Dietz, Lexington, and Walter G. Lehamann, Somerville, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 5, 1971, Ser. No. 104,062
Int. Cl. G03b *17/50*
U.S. Cl. 95—13 **29 Claims**



Photographic apparatus employing a gas-excluding filter interposed between a source of processing liquid and a processing chamber for providing a flow of gas-free processing liquid to exposed photographic material disposed within the processing chamber. Preferably, the source of liquid is provided within a disposable, variable-volume container or container-filter combination adapted for coupling to a processing chamber of a camera which includes a force supplying member for varying the volume of the reservoir-container so as to selectively vary the pressure differential across the filter and thereby direct gas-free processing liquid

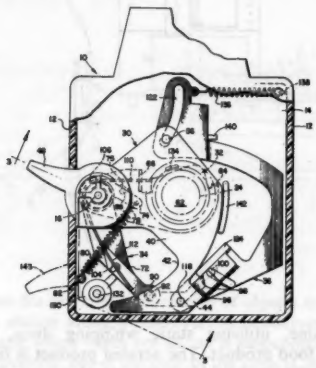
to or from the processing chamber. A transport element is included in the camera for positioning the exposed photographic material in the processing chamber pripr to dispensing of the liquid thereto and for removal of the liquid-treated photographic material subsequent to extraction of excess liquid from the chamber.

3,659,513

SELF-COCKING PHOTOGRAPHIC SHUTTER

Bruce K. Johnson, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed June 29, 1970, Ser. No. 50,378
Int. Cl. G03b 9/10
U.S. Cl. 95—59 **29 Claims**



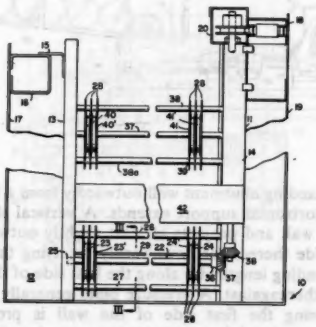
An exposure mechanism which is formed having a singular spring loaded shutter blade. This blade has a rest position normally wholly blocking the passage of light through an associated aperture. An actuator assembly mounted copivotally with the shutter blade is operative to engage and displace the blade from its blocking rest position to a wholly unblocking spring loaded position. Following an appropriate interval of exposure, the actuator assembly releases the shutter blade for return movement to its blocking rest position to terminate an exposure.

3,659,514

FILM TRANSPORT RACK

Ralph E. Steblay, Redlands, Calif., assignor to Phototron Co., Rialto, Calif.

Filed Oct. 23, 1970, Ser. No. 83,464
Int. Cl. G03d 3/12
U.S. Cl. 95—94 R **10 Claims**



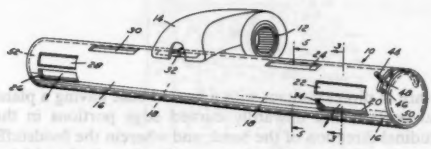
Apparatus for developing film including a shaft rotatably mounted in a film transport rack. The rack includes a film reel loosely mounted on the shaft for rotation therewith when the reel is held against the shaft by film disposed therearound under tension. A stationary brake is associated with the rack for braking the film reel into a stationary position with respect to the shaft independent of the rotation of the shaft when film tension is released from the film reel.

3,659,515

APPARATUS FOR DELIVERING MOVING AIR

Alexander H. Galaniuk, Southfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sept. 8, 1970, Ser. No. 70,253
Int. Cl. B60h 1/24
U.S. Cl. 98—2 **4 Claims**



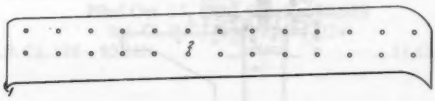
An apparatus for delivering moving air from a supply system to one of a plurality of spaced positions within a vehicle includes a stationary tube and a rotatable tube mounted within the stationary tube. The stationary tube has a plurality of apertures therethrough which are angularly spaced about the circumference of the tube for delivering moving air to the various positions. The movable tube has a limited number of apertures and depending upon its position within the stationary tube, the moving air is delivered from the assembled tubes through selected apertures of the stationary tube.

3,659,516

WINDOW VENTILATORS

Alastair Rigg MacDonald, 39 Cleuch Gardens, Clarkston, Renfrewshire, Scotland

Filed Oct. 8, 1969, Ser. No. 864,753
Int. Cl. B60h 1/24
U.S. Cl. 98—2.12 **1 Claim**



A window ventilator for a vehicle such as an automobile, comprises a sheet of transparent material such as glass or a plastics material, said sheet having formed therein a plurality of ventilation holes preferably by a moulding operation. The axes of the holes rise from the outside to the inside of the sheet relative to the fitment of the sheet in a window frame, the angle of inclination of said axes preferably being of the order of 45° to 55°.

3,659,517

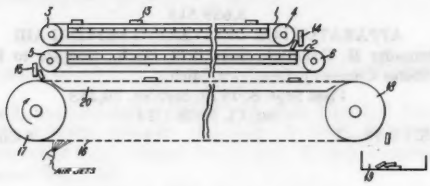
FRYING APPARATUS FOR FOODSTUFFS WHICH ARE TO BE FRIED ON BOTH SIDES

Kolbein Holen, Gaseid 5, 6000 Alesund, Norway

Filed Oct. 22, 1970, Ser. No. 83,107
Int. Cl. A47j 37/00
U.S. Cl. 99—355 **2 Claims**

Frying apparatus for foodstuffs which are to be fried on both sides, comprising a plurality of endless frying bands

disposed one above the other and passing over rollers, wherein the bands consist of a webbing which is coated on both sides with polytetrafluoroethylene (Teflon) or other substance having similar properties, and the underside of the



bands are in direct contact with a heated base having a plane central portion and upwardly curved edge portions in the longitudinal direction of the band, and wherein the foodstuffs are turned at the transition from one band to the band lying therebeneath.

3,659,518

HEATING APPARATUS

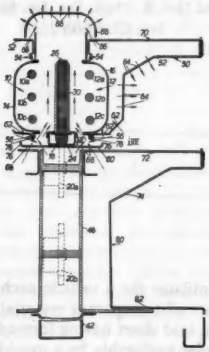
Ernest Henry Roberts Porter, Scottsville, Natal Province, Republic of South Africa, assignor to Ernest Henry Roberts Porter and Doris Lydia May Porter Porter, Scottsville, Pietermaritzburg, Natal Province, Republic of South Africa

Filed Jan. 13, 1970, Ser. No. 2,511

Claims priority, application South Africa, Jan. 22, 1969, 69/0505

Int. Cl. A47j *37/08*

U.S. Cl. 99—386 **2 Claims**



This invention relates to a heating apparatus for the heat-treatment of individual items, particularly for toasting slices of bread, cooking portions of meat such as chicken, hamburger, steak and sausages, and for curing individual items. The apparatus comprises a pair of spaced-apart elongated sources of heat energy, displacement means adapted to be displaced past the sources of heat energy and maintaining means provided on the displacement means for mounting a plurality of individual items.

3,659,519

APPARATUS FOR DEPOSITING AERATED FOOD PRODUCTS

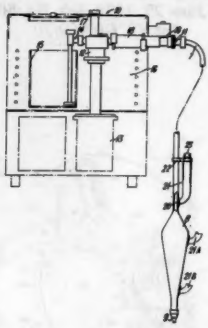
John MacManus, 143-16-Twenty-second Road, Whitestone, N.Y.

Filed Feb. 9, 1970, Ser. No. 9,666

Claims priority, application Great Britain, Feb. 13, 1969, 7,981/69; Sept. 5, 1969, 44,031/69

Int. Cl. A21b *5/00;* **A21d** *15/00*

U.S. Cl. 99—450.1 **12 Claims**



A machine, utilizing static whipping discs, aerates a whippable food product. The aerated product is fed through a hose to a forcing bag. Venting apparatus is provided at the junction of the hose and bag to eliminate air voids. The method includes pumping the aerated product through a hose to a forcing bag, alternately compressing the bag to extrude the product and releasing the compression to interrupt the extrusion without interrupting the supply to the bag, and venting any air voids from the bag before the product reaches the tip of the bag.

3,659,520

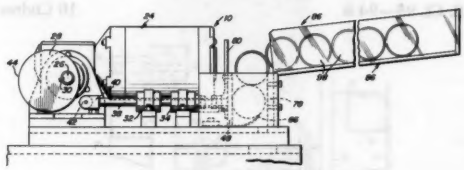
BEVERAGE CAN COMPRESSOR

Jimmy D. Garrett, and Charles E. Brown, both of 215 Ellis Ave., Maryville, Tenn.

Filed Mar. 19, 1970, Ser. No. 21,066

Int. Cl. B30b *15/30*

U.S. Cl. 100—216 **6 Claims**



An upstanding abutment wall outwardly from a first side of which a horizontal support extends. A vertical slot extends along the wall and projects at least slightly outwardly from the first side thereof for downwardly receiving therethrough a can extending lengthwise along the first side of the wall and flattened thereagainst. A pressure plate generally paralleling and opposing the first side of the wall is provided and guidingly supported for reciprocation toward and away from the wall for flattening a can thereagainst and the horizontal support includes a pair of bowed leaf springs disposed

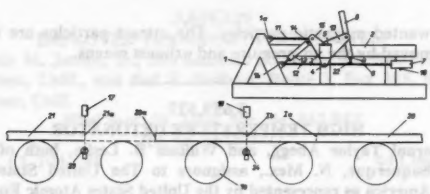
generally normal to and outwardly of the first side of the wall, supported at their ends remote from the wall and curving upwardly at their ends adjacent the wall for support of an unflattened can therefrom in elevated position relative to the slot, outwardly of which slot the ends of the springs adjacent the slot terminate.

3,659,521

APPARATUS FOR MARKING MOVING OBJECTS

Jan Lany, Ostrava, Czechoslovakia, assignor to Vitkovicke zelezarny Klementa Gottwalda, narodni podnik, Ostrava, Czechoslovakia

Filed July 16, 1969, Ser. No. 842,406
Int. Cl. B41f *17/20*
U.S. Cl. 101—4 **8 Claims**



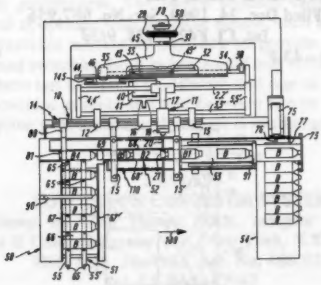
Apparatus for marking a succession of objects moving past a marking station along a conveyor. A pendulum mounted marking head which when not in use is suspended in a first, horizontal position out of the path of the objects, is provided. A sensor is energized when an object begins to approach the marking station move the marking head into a second, vertical, position spaced from but closer to the path of the object. As the object more closely approaches the marking station the marking head, still in vertical position, is moved into the path of the object to mark it, following which the marking head is retracted into its first position.

3,659,522

AUTOMATIC MACHINE FOR SILK-SCREEN PRINTING ON FILLED BOTTLES OF FLEXIBLE MATERIAL WITH FLAT FACES

Louis Gilbert Dubuit, 60 Rue Vitruve, Paris 20e, France

Filed Sept. 19, 1969, Ser. No. 859,444
Claims priority, application France, Oct. 31, 1968, 172134
Int. Cl. B41f *17/24*
U.S. Cl. 101—35 **9 Claims**



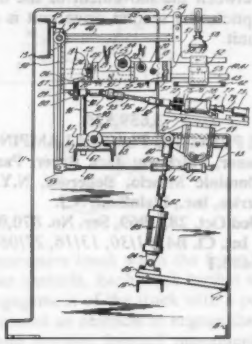
Improvements in machines for silk-screen printing on filled bottles of flexible material with flat faces, in which the bottle is compressed transversely during the printing operation in order to stiffen the face to be printed.

3,659,523

SCREEN PRINTING MACHINE FOR ROUND AND FLAT ARTICLES

Thomas W. Olsen, Wayne, N.J., assignor to Modern Decorating Company, Passaic County, N.J.

Substitute for application Ser. No. 700,856, Jan. 26, 1968, now abandoned. This application Nov. 16, 1970, Ser. No. 90,000
Int. Cl. B41f *17/18, 17/24, 17/28*
U.S. Cl. 101—38 R **11 Claims**



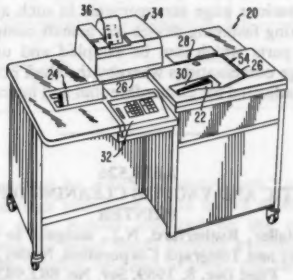
A screen printing machine for decorating bottles or like articles of various shapes which has interchangeable parts for component mechanisms such as screen, squeegee and article holder. It facilitates the decorating of articles of substantially round section by the use of a reciprocatingly moving screen and a stationary squeegee and the decorating of articles with at least one flat surface by the use of a stationary screen and a reciprocatingly moving squeegee.

3,659,524

PRINTER CONTROL SYSTEM

Jack Beery, Farminton, and William B. Templeton, Howell, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Oct. 15, 1970, Ser. No. 80,959
Int. Cl. B41j *9/10*; B41f *13/24*
U.S. Cl. 101—93 MN **11 Claims**



In a document printing machine comprising a plurality of interconnected modular sections, there is disclosed herein a printer module having a self container control system. Documents, to be printed upon, are sequentially passed through

the printer module under the control and drive of either one of two different speed drive units. The second drive unit initially functions as a control gate to control the feeding of documents into the printer module. When the printing operation is to begin, the second drive unit moves the documents through the printer module at a positively controlled printing speed. After the printing operation, the first drive unit moves the documents out of the printer module at a high speed.

In order to maintain the correct character pitch between adjacent serially printed characters, a timing unit is operatively connected to the first drive unit. This timing unit is responsive to drive variations and accurately divides each character pitch into a plurality of intervals. Each interval controls one or more printer operation functions including the actual print operation. In order to maintain the synchronism between the movement of the documents and the character pitch, the second drive unit is clutched from the first drive unit.

3,659,525

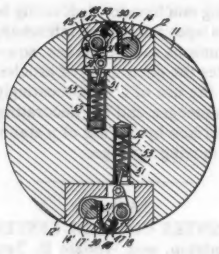
FLEXIBLE PRINTING PLATE CLAMPING DEVICE

Richard Woessner, Fairlawn; Jack Bryer, Paramus, both of N.J., and Dominic Mascio, Bellerose, N.Y., assignors to Wood Industries, Inc., Plainfield, N.J.

Filed Oct. 28, 1969, Ser. No. 870,027

Int. Cl. B41f *1/30, 13/16, 27/06*

U.S. Cl. 101—415.1 **4 Claims**



A plate cylinder of a printing machine has two separate fastening devices for thin flexible printing plates for various page sizes. One of the fastening devices is constructed for adjusting of both the circumferential and the lateral register of plates for various page arrangements in such a manner that the registering fastening device has a shaft comprises several individual parts which can be coupled and uncoupled for various page combinations whereby the shaft portions can be separately adjusted for circumferential and lateral register.

3,659,526

MAGNETIC AND VACUUM CLEANING DEVICE FOR PRINTER

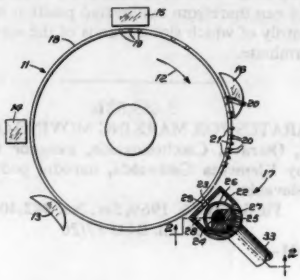
Karel J. Staller, Rutherford, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Dec. 8, 1969, Ser. No. 882,983

Int. Cl. B41f *35/02*

U.S. Cl. 101—425 **1 Claim**

Means are provided to remove particles from unwanted portions of a recorded surface which has been powdered for printing. The means include a slotted tube which is selectively magnetizable to form a weak magnetic field and attract the



unwanted magnetic particles. The attract particles are then removed by the air pressure and exhaust means.

3,659,527

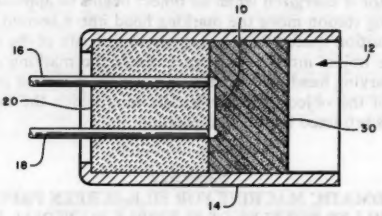
HIGH TEMPERATURE DETONATOR

Moroni Taylor Abegg, and William B. Leslie, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Oct. 29, 1970, Ser. No. 85,072

Int. Cl. F42c *19/12*; **F42b** *3/12*

U.S. Cl. 102—28 EB **3 Claims**



A high temperature or radiation resistant exploding bridge wire detonator having an azo-bishexanitrobiphenyl explosive charge positioned adjacent the exploding bridge wire.

3,659,528

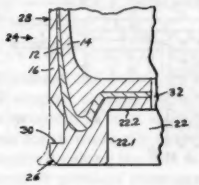
COMPOSITE METAL CARTRIDGE CASE

Teuvo Santala, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 24, 1969, Ser. No. 887,956

Int. Cl. F42b *5/28, 9/28*

U.S. Cl. 102—43 F **9 Claims**



An ammunition cartridge cause is shown to comprise a deep, open-ended cup having a base of substantial thickness,

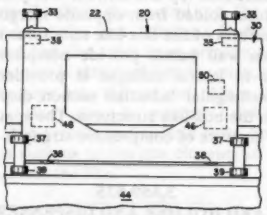
having a relatively thin, generally cylindrical wall upstanding from the base and having an annular, peripheral, extraction groove formed in the base, the base having a recess which opens oppositely of the open cup end for receiving a primer cup therein. The cartridge case if formed of a composite metal laminate material having a core metal layer sandwiched between and metallurgically bonded to outer layers of other metal materials. The core metal layer of the laminate material extends as a core throughout the wall of the cup and the base of the cup and is disposed within the cup base to surround the bottom and lateral walls of the primer cup recess to provide adequate case strength in the primer cup area. The core material is arranged within the cup base so that the core material is completely covered by the outer layer material of the laminate at the location of the cartridge extraction groove.

3,659,529

IMPROVED TRANSPORTATION SYSTEM

Justin M. Jacobs, Jr., 500 Sansome St., Suite 501, San Francisco, Calif., and Neil S. Stafford, Route 3, Box 355, San Jose, Calif.

Filed Sept. 29, 1969, Ser. No. 861,843
Int. Cl. B61b *3/02*
U.S. Cl. 104—88 **44 Claims**



The disclosure is of a transportation system which includes an elongated guidebeam having three spaced apart running surfaces. Two of the running surfaces are substantially vertical to accommodate wheels rotating about vertical axes and the third running surface is substantially horizontal to accommodate wheels rotating on horizontal axes. Wheels which rotate on a vertical axis and wheels which rotate on a horizontal axis are connected to a rack which is adapted to move along the running surfaces of the guide-beam. The wheels connect the rack on the side of the guidebeam in cantilever fashion. Connecting switch sections are provided at desired locations on the elongated guidebeam to connect two or more guidebeams. The switch sections have no moving parts and cooperate with movable means, such as extendable and retractable wheels, of the rack to provide for selective high speed switching both in horizontal and vertical modes of a rack between an upline guidebeam and one or more spaced apart downline guidebeams and between two or more spaced apart upline guidebeams and a single downline guidegeam.

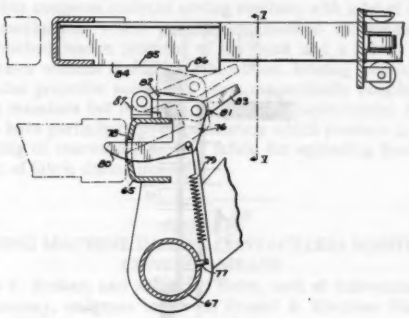
3,659,530

TOW TRUCK CONVEYOR SYSTEM

Paul Klamp, St. Clair Shores, Mich., assignor to American Chain & Cable Company, Inc., New York, N.Y.

Filed Sept. 21, 1965, Ser. No. 488,922
Int. Cl. B65g *17/42*
U.S. Cl. 104—172 BT **12 Claims**

The tow truck conveyor system disclosed herein comprises a conveyor mounted for movement along a slot and a plurality of trucks. Each truck has a truck body and means thereon movable through the slot into and out of engagement with the conveyor. A front bumper is movably mounted on the truck body and operatively connected with the conveyor engaging means so that when the front bumper is moved rearwardly by contact with an obstacle, the conveyor engaging means is moved out of engagement with the conveyor. A rear bumper is movably mounted on the truck body and operatively connected with the front bumper so that the rear bumper is moved into position for engagement with the front



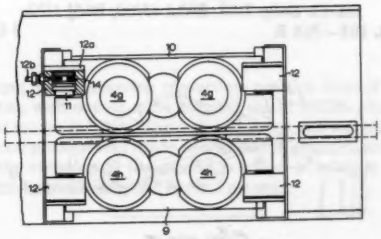
bumper of a successive truck when the front bumper of the truck engages an obstacle. Each truck further includes means operable by engagement of the truck with a preceding truck that has encountered an obstacle to engage the front bumper of the truck and prevent forward movement of the front bumper when the rear bumper of a preceding truck in advance of said truck moves forwardly due to the removal of the obstacle in the path of the front bumper of the preceding truck.

3,659,531

DRAWING MACHINE FOR RODS AND TUBING

Alfons Goeke, Solingen, Germany, assignor to Th. Kieserling & Albrecht, Solingen, Germany

Filed Sept. 4, 1969, Ser. No. 855,135
Claims priority, application Germany, Sept. 7, 1968, P 17 77 110.7
Int. Cl. B23q *5/22*
U.S. Cl. 105—30 **10 Claims**

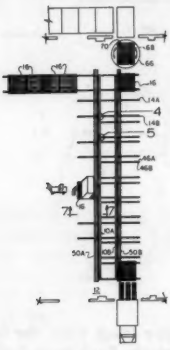


An arrangement by which elongated articles are drawn through a carriage rolling on guide tracks extending along the drawing path. Rollers mounted on the carriage are pressed against the guide tracks through hydraulic cylinders to develop the friction required to move the carriage along the guide tracks. Hydraulic motors on the carriage are mechanically linked to the rollers for the purpose of supplying the necessary driving power of the carriage. The traction or driving force required to move the carriage for the drawing operation is developed entirely through friction between the rollers and the guide tracks.

3,659,532
PALLET AND RAIL MATERIAL HANDLING APPARATUS

Necati Kanatsiz, Spring Valley, and Floyd E. Davis, San Diego, both of Calif.

Continuation of application Ser. No. 783,021, Dec. 11, 1968, now abandoned. This application Apr. 12, 1971, Ser. No. 133,408
Int. Cl. B61f 11/00; B61j 1/10
U.S. Cl. 105—177 5 Claims

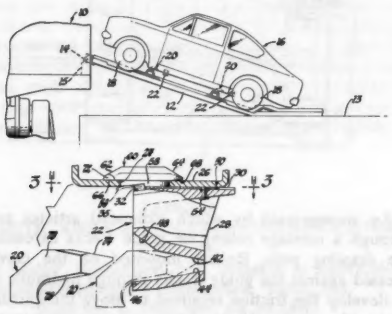


Conveying apparatus comprising tracks which form a main line, a plurality of spur tracks which intersect the main line tracks and extend laterally therefrom, and one or more pallets provided with rotatable ball supports which roll on said main line and spur tracks and which permit pallets to be transferred therebetween. The pallets are provided with rotatable support members at their upper surfaces to facilitate loading and unloading of materials thereon and to enable the apparatus to be used as a conventional conveyor when a plurality of the pallets are placed in end-to-end relation along the aforesaid tracks.

3,659,533
DEVICE FOR SECURING VEHICLE TO TRANSPORTER DOOR

Anthony Venditty, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 16, 1970, Ser. No. 89,711
Int. Cl. B60p 7/08; B61d 45/00; B65j 1/22
U.S. Cl. 105—368 R 3 Claims

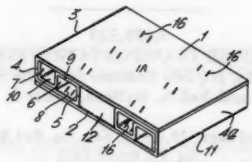


A securement device for maintaining a vehicle in a secured position on an upright transporter door and having a first section adapted to be located in an oblong slot formed in the underbody of the vehicle and a second section for automatic locking engagement with a projecting member rigidly mounted on the transporter door when the vehicle is driven onto the door.

3,659,534
FORK LIFT TRUCK PALLET

Mark Glendower Hyde Childs, Corringham, Essex, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Sept. 17, 1969, Ser. No. 858,834
Int. Cl. B65d 19/18
U.S. Cl. 108—56 3 Claims

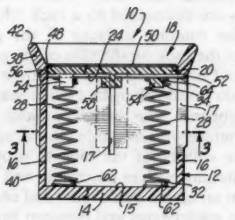


A fork lift truck pallet folded from blanks of board material and having identical top and bottom wall panels each with box-like structures folded from opposite marginal edge portions. Wall members of the box-like structures normal to the top and bottom wall panels provide compressive strength, and resistance to lateral collapse is provided by spacing members of rectangular tube-like section disposed at right angles between the box-like structures. The spacing members also provide a measure of compressive strength.

3,659,535
CARD HOLDER AND DISPENSER

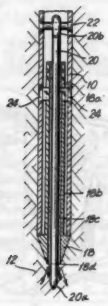
Florian B. Cerney, and Tina M. Cerney, both of 1405 1/4 North Havenhurst Drive, Los Angeles, Calif.

Filed Dec. 4, 1969, Ser. No. 881,958
Int. Cl. A47b 9/02
U.S. Cl. 108—136 2 Claims



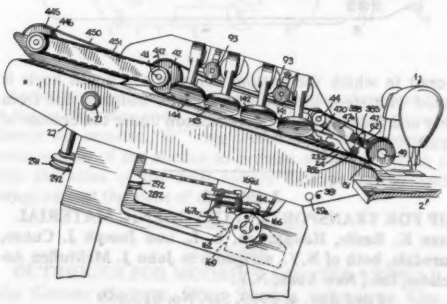
A device for holding and dispensing playing cards one at a time and providing ready access to the top card of the stack, which includes a container having a base, four walls, and an open top; a movable platform for supporting the card stack which is mounted within the container; biasing means urging the movable platform and the cards stacked thereon in an upward direction whereby the top card will be in proper position relative to the open top; and means for restricting and guiding the vertical movement of the movable platform within the container.

3,659,536
ROOT FEEDER DEVICE
Robert B. White, 13 County Club Drive, Larchmont, N.Y.
Filed Oct. 1, 1970, Ser. No. 77,144
Int. Cl. A01c *23/02*
U.S. Cl. 111—7.1 6 Claims



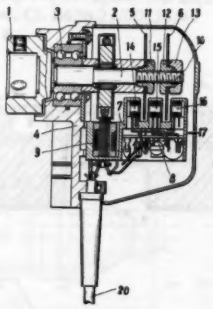
A root feeding device is disclosed, the device comprising a hollow pipe adapted to be connected to a liquid source and having a generally pointed central rod suspended past the lower end thereof. A valve core is slidably disposed in the pipe concentrically about the central rod, the valve core extending beyond the pipe and defining a leading tip therefor. The central rod and the valve core provide axial fluid flow when the valve core is retracted into the pipe, thus aiding immersion of the pipe into the ground. When the pipe is immersed, the valve core is partially slidably retracted therefrom to thus provide radial fluid flow. Importantly, the construction is such as to obviate clogging of the apparatus by soil, pebbles and the like.

3,659,537
SEAM FINISHING APPARATUS
Victor J. Sigoda, Great Neck, N.Y., assignor to Man-Sew Corporation, New York, N.Y.
Original application June 5, 1967, Ser. No. 643,458, now Patent No. 3,478,451, Continuation-in-part of application Ser. No. 481,522, Aug. 23, 1965, now Patent No. 3,372,497. Divided and this application July 18, 1969, Ser. No. 853,575
Int. Cl. D05b *27/00, 27/10, 27/06*
U.S. Cl. 112—217 10 Claims



Tandem arrangement of sewing machine and ironing mechanism in which the latter has a positively driven, thin, heat transfer belt heated by retractable heat pod(s) brought into engagement with belt only when belt speed exceeds predetermined rate, and conveying members for which drive is derived from sewing machine transmitter in an arrangement in which the ironing mechanism operates only during sewing. Includes an adjustable speed transmission and additional mechanism by which operator can reduce speed or suspend operation of conveying members while continuing sewing to provide slack in fabric between sewing machine and ironing mechanism to permit negotiation of certain curved portions of garments. Ironing mechanism includes a floating buck with fabric pressing taking place between floating buck and moving heat transfer belt. Two layered bridging member connects outlet of sewing machine with inlet of ironing mechanism which permits longitudinal movement of sandwiched leadon portions of the buck and a fabric plies separator without disrupting connection. Ironing mechanism includes prepuller using feed discs magnetically coupled to drive members but mounted for vertical displacement. Feed discs have partially tapered perimeters which produce lateral skewing of rearwardly moving fabric for spreading free ply edges of fabric during ironing.

3,659,538
SEWING MACHINE HAVING CONTACTLESS POSITION CONTROL MEANS
Hugo F. Bosken, and Alfred K. Heidt, both of Schwetzingen, Germany, assignors to Firma Frankl & Kirchner Fabrik Fur Elektromotoren Und Elektrische Apparate, Schwetzingen Baden, Germany
Filed May 15, 1970, Ser. No. 37,542
Claims priority, application Germany, May 17, 1969, P 19 25 301.1
Int. Cl. D05b *69/22*
U.S. Cl. 112—219 A 7 Claims

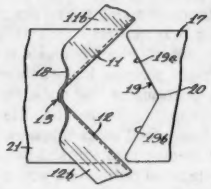


Sewing machine having contactless position control means operating with one or more rotating shield blades where the control means for operating a thread cutter has an additional displaced phase shield blade sector that is effective to determine the stopping of the sewing machine in relation to the position determined by the control means.

3,659,539
MECHANISM FOR FORMING A CORNER JOINT FLANGE
Russel F. Schnepper, Boonville, Ind., assignor to Whirlpool Corporation
Original application July 30, 1969, Ser. No. 846,194, now Patent No. 3,584,371. Divided and this application Feb. 16, 1971, Ser. No. 115,272
Int. Cl. B21d *51/02*
U.S. Cl. 113—1 G 6 Claims

A method of forming a reinforced sheet metal corner joint wherein a flange is formed across a welded joint in such a way as to gather the metal toward the joint and effectively

preclude splitting of the joint in the formation of the reinforcing flange. The metal is gathered toward the welded joint by means of a V-shaped concave die whereby the edge of the metal sheets is progressively turned as the die surfaces move along the metal edge progressively toward the apex of die. The sheet metal is firmly held adjacent the edge by suitable clamp means permitting the edge to be turned by the die into accurate perpendicular relationship to the corner joint.

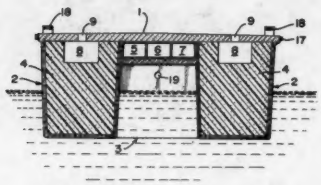


3,659,540

MONOLITHIC FLOATING WHARVES

Kenneth L. Toby, 1551 Mount Douglas X Road, and Rodney W. S. Wells, 1329 Stanley Street, both of Victoria, British Columbia, Canada

Filed Mar. 17, 1970, Ser. No. 20,198
Int. Cl. B63b *35/00*
U.S. Cl. 114—0.5 F **8 Claims**



Monolithic reinforced concrete flotation units constructed to be assembled as single or multiple wharves with provision for the safe carriage of power, fuel and communication services and with provision for storage lockers. Such units are designed specifically for boat moorage but with modification in arrangement and assembly of the units or modification in size or shape, the units may be used for a variety of other purposes such as floating walkways or causeways, diving platforms, breakwaters, flotation units for boat moorage sheds and marine refueling stations.

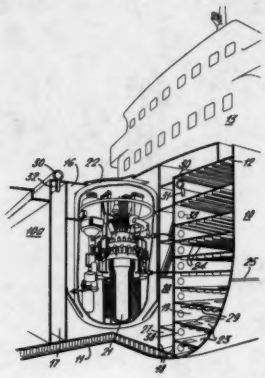
3,659,541

NUCLEAR POWERED SHIPS

Shephard Rigg, Warrington, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Aug. 18, 1969, Ser. No. 850,898
Claims priority, application Great Britain, Aug. 26, 1968, 40,789/68
Int. Cl. B63b *35/00*
U.S. Cl. 114—05 **5 Claims**

A nuclear powered ship has its collision barriers made water tight and means are provided for filling the barriers with water to act as a shield against radiation in the event of, or as a precaution against, a "maximum credible accident," thus avoiding the need for a permanent shield outside the reactor containment vessel. Coffer dams in the ship can be similarly treated to give protection to the ship's crew. The means for filling the barriers may be a ring main pipe with access fore and aft of the ship or the ship's ballast system may be adapted to provide the filling water for the barriers.



3,659,542

AIR-CUSHION MARITIME CRAFT

Vitaly Ivanovich Petrov, ulitsa Frunze, 6a, kv. 147; Alexandr Nikolaevich Ivanov, Basseinaya ulitsa, 31, kv. 29; Jury Leonidovich Olenin, Moskovskoe shosse, 20, korpus 5, kv. 5; Arnold Oskarovich Eller, V.O., 6 Linia, 49, kv. 19; Anatoly Akimovich Butuzov, Kransnoputilovskaya ulitsa, 19, kv. 22; Abram Moiseevich Basin, ulitsa Lenina, 48, kv. 7; Vladimir Borisovich Starobinsky, ulitsa Professora Kochalova, 6, kv. 3; Efim Rafailovich Ratner, Prospekt Stachek 132 kv. 78, and **Oleg Fedorovich Potapov, Nevsky prospekt, 23, kv. 10, all of Leningrad, U.S.S.R.**

Filed Aug. 14, 1969, Ser. No. 850,038
Int. Cl. B63b *1/34*
U.S. Cl. 114—67 A **2 Claims**

A craft in which the bottom between the board keels is provided with steps located at a definite distance one from another and forming a stable air-cushion under the bottom of the craft.

3,659,543

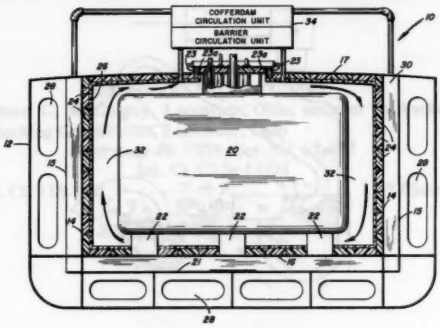
SHIP FOR TRANSPORTING CRYOGENIC MATERIAL

Norman K. Basile, Hauppauge, L. I., and Joseph J. Cuneo, Scarsdale, both of N.Y., assignors to John J. McMullen Associates, Inc., New York, N.Y.

Filed Apr. 4, 1969, Ser. No. 813,669
Int. Cl. B63b *25/08*; B65d *25/00*
U.S. Cl. 114—74 **11 Claims**

A ship of simplified construction is adapted for the marine transportation of cryogenic material. At least one single barrier containment tank is located within the hull of the ship. On the inboard side of the inner hull and transverse bulk-

heads of the ship is provided a thermal insulating system, and covering the inner surface of this insulating system is a gas and liquid impervious liner. A space is provided between the liner and the wall of each containment tank and a cofferdam is provided outboard of the inner hull, outboard of the inner



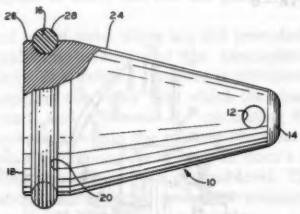
bottom and between the transverse bulkheads. Two circulation systems are provided, the first being provided in the space intermediate the liner and the tank, and the second being provided in the space defined by the cofferdam. Means for the detection of leaks in the containment system are also provided.

3,659,544

BOAT ANCHOR

Rudolph A. Goepfrich, 1109 North Cleveland Avenue, South Bend, Ind.

Filed Dec. 12, 1969, Ser. No. 884,496
Int. Cl. B63b *21/24*
U.S. Cl. 114—206 R **2 Claims**



An improved anchor is of conical construction, and has at its larger diameter end a groove which is adapted to receive therein an annular "O" ring which protrudes beyond the outer surface of the anchor to provide a bumper which protects the sides of the boat against damage as the anchor swings against the sides of the boat.

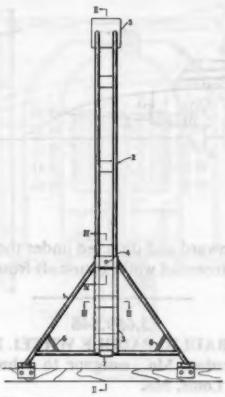
3,659,545

OUTRIGGER FOR MOORING A WATER VEHICLE

John Gunnar Hedman, Piteå, Sweden, assignor to Klas O. Tellberg AB, Saltsjo-Duvnas, Sweden

Filed Feb. 12, 1970, Ser. No. 10,862
Claims priority, application Sweden, Nov. 27, 1969, 16306/69
Int. Cl. B63b *21/00*
U.S. Cl. 114—230 **6 Claims**

An outrigger for mooring water vehicles consisting of a device being pivotable or turnable in a vertical plane and connected to a quay, bridge or similar, and a boom



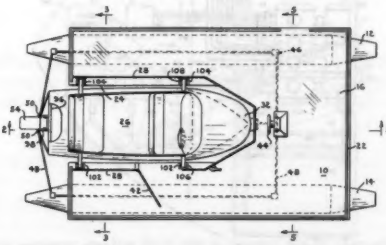
detachably secured to said device and possibly also to the quay.

3,659,546

MOTOR BOAT PROPELLED PONTOON BOAT

Louis F. Miklos, 6151 Delaware Street, Lake County, Ind.

Filed Apr. 6, 1970, Ser. No. 25,738
Int. Cl. B63b *21/00, 35/44*
U.S. Cl. 114—235 R **8 Claims**



This invention relates to pontoon boats which normally carries a dingy for transporting the passengers to and from the pontoon boat. The stern end of the pontoon boat is provided with a novel structure for incapsulating a motor boat which provides the motive means to propel the pontoon boat. This invention combines the motor boat and pontoon boat to form an integral structure for purposes of propulsion of both crafts. Both crafts are separable when it is desired to use the motor boat as a tender craft.

3,659,547

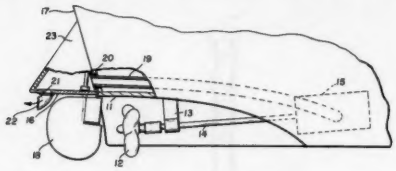
EXHAUST SYSTEM FOR TUNNEL STERN BOAT

Robert B. Stuart, Penn Yan, N.Y., assignor to Penn Yan Boats Incorporated, Penn Yan, N.Y.

Filed June 1, 1970, Ser. No. 42,134
Int. Cl. B63h *21/32*
U.S. Cl. 115—34 R **12 Claims**

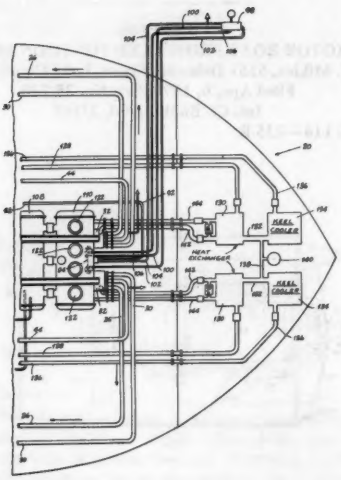
In a tunnel stern boat having a propeller in the tunnel and a spray plate and rudder aft of the tunnel, the exhaust from

an inboard engine is piped to a transom opening from which



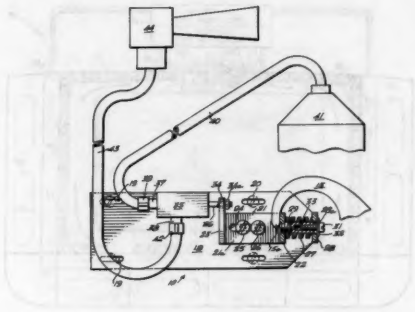
it is guided downward and directed under the spray plate into the high speed stream of water thrust aft from the propeller.

3,659,548
HYDRAULIC PADDLE WHEEL BOAT
John Fabick, Fenton, Mo., assignor to John Fabick Tractor Company, St. Louis, Mo.
Filed Aug. 19, 1970, Ser. No. 65,178
Int. Cl. B63h *1/04*
U.S. Cl. 115—49 **3 Claims**



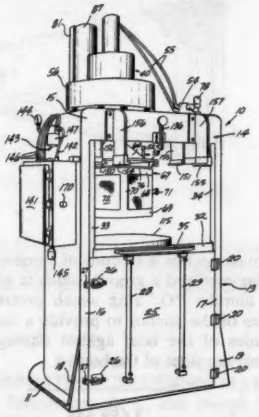
A paddle wheel boat, hydraulically operated by oil under pressure supplied to a reciprocatory drive cylinder, driving the paddle wheel by a Pitman connection. The boat is powered by a diesel engine driving a hydraulic pump, which supplies oil under pressure on alternate sides of a piston in the drive cylinder. A thrust rod is connected to the piston and also at an opposite end to the paddle wheel, and by reciprocatory action of the drive cylinder controlled by a sequencing rod to control the alternate admission of oil to one side or the other side of the piston, the paddle wheel is driven. Provision is made for reversing the paddle wheel operation by means of a reversing or directional control valve which reverses the flow of oil. By means of surge chambers and accumulators, shock in the system is easily controlled. A pilot system for operating the directional control valve is provided through a pilot pump also driven by the diesel engine.

3,659,549
LOCK ALARM DEVICE
William Wagner, 1800 West 4th Avenue, Hialeah, Fla.
Filed Oct. 5, 1970, Ser. No. 78,048
Int. Cl. E05b *45/00*
U.S. Cl. 116—8 **9 Claims**



A lock alarm mechanism for vending machines and the like is described, including a key-operated latch member secureable to a hinged housing door or panel member and lockingly interengageable with a latch bar member resiliently supported with respect to the associated housing member and operative, only during intervals of attempted forcing of the lock such as by prying between the door or panel member and the housing member, to yieldingly move the latch bar member and thereby actuate a self-contained alarm in the housing structure protected.

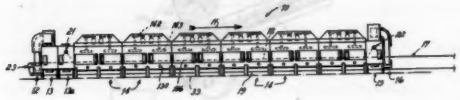
3,659,550
FLUID OPERATED COATING AND DRYING MACHINE
Wayne F. Fulton, Moorepark, Mich., assignor to Spring Tools Corporation, Schoolcraft, Mich.
Filed Nov. 9, 1970, Ser. No. 87,926
Int. Cl. B05c *11/12*
U.S. Cl. 118—6 **6 Claims**



An apparatus is provided for painting or otherwise treating solid articles or parts with a liquid and subsequently removing excess liquid, comprising a container for the articles or parts, a tank for containing the liquid, means for dipping the container and articles to immerse the articles in the liquid, and means for retracting the container from the liquid and spinning the container to remove excess liquid and drying

while the container and articles are within the confines of the tank. All functions are accomplished by air-operated or other fluid means and controlled by valves actuated by an air-operated fluidic circuit, and in the complete absence of any electrical circuits, thereby avoiding any danger of explosion by ignition of the liquid which might be caused by an electrical spark.

3,659,551
GLASS TREATING TUNNEL
Richard G. McKinstry, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Aug. 10, 1970, Ser. No. 62,489
Int. Cl. C23c *11/00*
U.S. Cl. 118—48 **7 Claims**



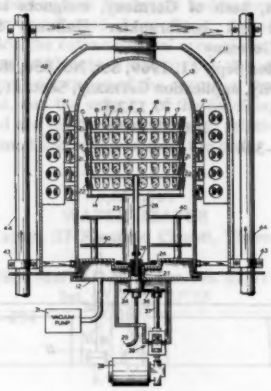
A glass treating tunnel or furnace particularly adapted to expose glass articles to treating vapors. The tunnel comprises, in order from inlet end to outlet end, an inlet air door, an inlet dead zone, a treating chamber, an outlet dead zone, and an outlet air door. Preferably, an open mesh belt traverses the glass treating tunnel from one end to the other, the belt being adapted to carry thereon the glass articles to be treated.

The inlet and outlet dead zones are not provided with atmosphere circulation means, and the atmosphere within them is quiescent. The treating chamber is provided with apparatus for supplying the vapor with which the glass articles are to be treated, and apparatus for circulating the vapor containing atmosphere within the treating chamber. Heating elements control the temperature of each air door's airstream of the circulating atmosphere to a desired level. This structural combination unexpectedly promotes maintenance of the treating vapors within the treating chamber.

Vapor drift may tend to occur toward one end or the other of the treating chamber through one or the other of the inlet and outlet air doors, the direction of the drift being mainly dependent on atmospheric conditions outside the glass treating tunnel. Drift controlling means are provided in the inlet and/or outlet dead zones, which counteract such vapor drift, thereby promoting maintenance of treating vapors within the treating chamber.

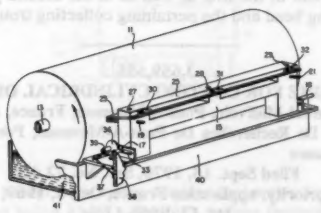
3,659,552
VAPOR DEPOSITION APPARATUS
Thomas F. Briody, Bethlehem, Pa., assignor to Western Electric Company, Incorporated, New York, N.Y.
Filed Dec. 15, 1966, Ser. No. 601,885
Int. Cl. C23c *13/08*
U.S. Cl. 118—49.5 **8 Claims**

A vapor deposition apparatus includes a susceptor formed as an annulus about a vertical axis and having pockets on the inner, vertical wall adapted to support substrates therein. Means rotate the annulus at speeds to effect a centrifugal



retaining force on substrates so supported. Inductive heating means is provided.

3,659,553
ADJUSTING DOCTOR BLADE ARRANGEMENT FOR USE WITH A DRUM APPLICATOR
Philip E. Tobias, 1872 Watson Rd., Abington, Pa.
Filed Oct. 8, 1970, Ser. No. 79,087
Int. Cl. B05c *1/08*
U.S. Cl. 118—261 **7 Claims**



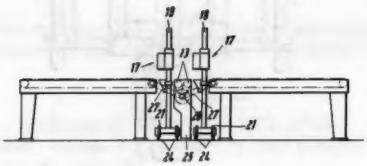
The present device includes a doctor blade mounted on a holder, which holder is further mounted on a pair of slideable rods. In addition, mounted on the holder are two threaded pivot members made of material which will not score nor scratch the drum, with which the doctor blade is used. The pivot members are adjustably disposed to come to rest against the drum. Further in addition, there is an eccentric cam disposed to abut one of said slideable rods and said last mentioned slideable rod is spring loaded to be held against said cam. Accordingly, as said cam is rotated it determines the "at rest" location of said engaged slideable rod and thus said holder. This last mentioned action causes the doctor blade to pivot or be partially rotated around the ends of said pivot members. In response to this action the doctor blade is located at a chosen distance from the drum (thereby determining the thickness of the material transported by the drum for application to a sheet of paper or the like). Because the holder is "floating" on the slideable rods, the holder will be moved toward and away from said drum, in response to any eccentricities or irregular surfaces of the drum, so that the layer of material that is being transported by the drum for application will have a constant thickness.

3,659,554

POURING PLANT, ESPECIALLY FOR LACQUERS, VARNISHES, ENAMELS, AND THE LIKE

Helmut A. Friz, Stuttgart, and Alfred Dettelbach, Stuttgart-Sommerrain, both of Germany, assignors to Adolf Friz Gesellschaft mit beschrankter Haftung, Stuttgart-Bad Cannstatt, Germany

Filed Sept. 11, 1969, Ser. No. 856,987
Claims priority, application Germany, Sept. 11, 1968, P 17 77 132.3
Int. Cl. B05c *5/00*
U.S. Cl. 118—314 2 Claims



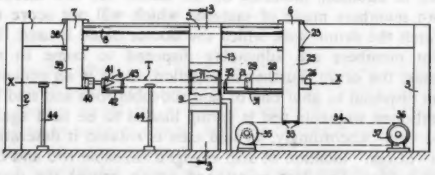
A pouring installation with at least one pouring station for pouring liquids, in which work pieces to be processed are conveyed by conveying means past a pouring head and a collecting trough which latter together with said pouring head is movable selectively from a first position in the path of said conveying means into a second position out of said path and vice versa, while storage means for storing the liquid to be conveyed to the pouring head are provided from which the liquid is pumped to the pouring head and while said pump and said storage means and said collecting trough form a closed circuit in the first as well as in the second position of the pouring head and the pertaining collecting trough.

3,659,555

MACHINE FOR COATING CYLINDRICAL OBJECTS

Roger Marcel Malivoir, Pont-A-Mousson, France, assignor to Centre De Recherches De Pont-A-Mousson, Pont-A-Mousson, France

Filed Sept. 15, 1970, Ser. No. 72,436
Claims priority, application France, Oct. 2, 1969, 6933671
Int. Cl. B09b *13/04*
U.S. Cl. 118—320 5 Claims



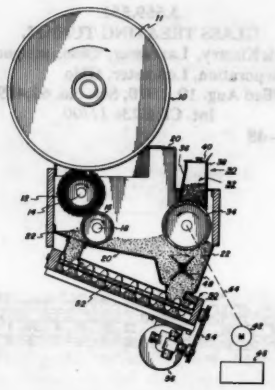
A machine for externally coating a pipe. The pipe is made to rotate and travel lengthwise through a coating cabin having openings allowing the passage of the pipe. At least one coating gun extends into the cabin for coating the pipe as it moves through the cabin. A duct communicates with the interior of the cabin for discharging harmful gases and particles produced in the course of coating.

3,659,556

PROGRAMMABLE TONER DISPENSER

Edward Charles Mutschler, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 19, 1970, Ser. No. 65,052
Int. Cl. G03g *13/00*
U.S. Cl. 118—637 6 Claims



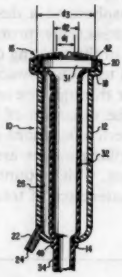
A dispenser for replenishing the toner portion of a mixture of toner and carrier, the mixture developing a latent image formed on an image-bearing surface. A container including spaced-apart side walls is positioned adjacent a rotatable member, the bottom of the side walls being shaped to fit the curvature of the member. The toner is introduced into the container and is dispensed as the member is rotated and at a rate proportional to its speed. In a specific embodiment, the amount of toner dispensed is dependent on the density of the developed image and/or the image printing rate.

3,659,557

TEAT CUP INFLATION

Daniel O. Noorlander, 5707 North Bond, Fresno, Calif.

Filed Mar. 23, 1970, Ser. No. 21,812
Int. Cl. A01j *05/04*
U.S. Cl. 119—14.36 10 Claims



A teat cup assembly for an automatic milking machine including an inflation assembly having a retaining diaphragm integrally formed with the cup liner for engaging the teat of a cow to retain the cup against falling off while venting the space between the teat and liner at the end point of milking. The inflation is formed by initially molding the liner and diaphragm from a single mass of resilient elastic material, with the diaphragm having vent means integrally formed

thereon to permit the egress of air into the liner at the end point of the milking operation. The configuration of the vent means facilitates molding the liner and diaphragm as a unitary structure.

3,659,558

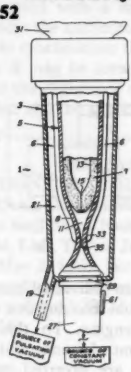
TEAT CUP INFLATION

Daniel O. Noorlander, 5707 North Bond, Fresno, Calif.

Filed Mar. 23, 1970, Ser. No. 21,813

Int. Cl. A01j *05/04*

U.S. Cl. 119—14.52 **9 Claims**



Provided is a teat cup inflation which prevents mastitis by eliminating contaminated milk forced backwash which usually occurs during the rest cycle of automatic milking operations and at the same time provides for uniform and adequate massage of the teat. This is accomplished by providing in combination (1) a rigid air-vent plug in the wall of the inflation located just below the pulsating vacuum chamber shell and (2) an inflation having a cross-sectional area of longitudinally reinforced portions and longitudinal unreinforced portions along that section of the inflation which is enclosed within the shell, such that when the inflation collapses, there is effected along the entire length of the teat a massaging action and at the same time there is insured, upon maximum collapse and even as the inflation begins to wear out, a remaining orifice of from about 0.012 square inches to about 0.028 square inches connecting the milking vacuum to the inflation cavity immediately below the end of the teat.

3,659,559

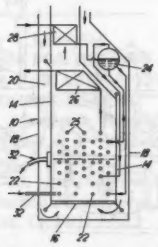
FLUIDISED BED BURNER CONTROL

Gabriel F. Foldes, Banstead; Peter W. Neve, Biggin Hill, and Peter J. Corbridge, London, all of England, assignors to Foster Wheeler Corporation

Filed June 22, 1970, Ser. No. 48,221

Int. Cl. F22b *1/02*

U.S. Cl. 122—4 D **11 Claims**



There is described herein a fluidised bed burner for a steam boiler. It has been found to be difficult to control the operation of such burners in response to varying heat outputs so as to meet steam load demands. According to the invention this control is achieved by providing an overflow takeoff for the bed particles which is adjustable in relation to the height to the bed so that the height and accordingly volume of the bed can be adjusted. According to a preferred feature of the invention the cross-sectional area of the bed increases with increasing bed height. This provides the advantages that a relatively fine adjustment of the output of the bed is possible a low load, and the velocity of the fluidising gases at the top of the bed are relatively slow and so relatively fed particles are entrained and removed from the bed.

3,659,560

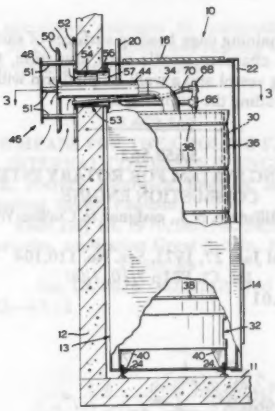
WATER HEATER

Wilfred G. Carter, 37 Romfield Circuit, Thornhill, Ontario, Canada

Filed Mar. 23, 1970, Ser. No. 21,617

Int. Cl. F22b *37/36*

U.S. Cl. 122—494 **2 Claims**



A water heater comprising a cylindrical water tank having a gas burner below it and a flue pipe passing through the tank for heating the water. The tank is enclosed in a square sectioned housing having an air inlet to which air from outside the building can be fed. An air intake duct (which leads to the outside of the building) is connected to the air inlet of the heater and is of sufficiently large diameter to allow the flue pipe to pass coaxially through it with sufficient space between the flue pipe and the air intake duct for the supply of combustion air to the burner.

3,659,561

FRAMELESS WATER PIPE BOILER

Willibald Kraus, Grebenstein, Germany, assignor to Rheinstahl Henschel Aktiengesellschaft, Kassel, Germany

Filed June 22, 1970, Ser. No. 48,312

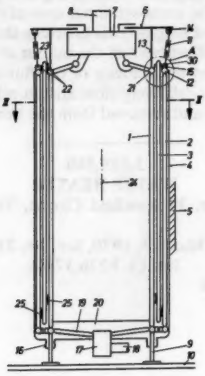
Claims priority, application Germany, June 23, 1969, P 19 31 717.0

Int. Cl. F22b *37/24*

U.S. Cl. 122—510 **10 Claims**

Self-supporting water pipe boiler with two or more co-axially arranged cage heating surfaces each of which comprises vertical pipes and upper and lower headers or reversing bends while the individual cage heating surfaces are differently designed as evaporator, superheater, or feed water preheater or hot water generator or one and the same cage

comprises different heating surfaces, in which the inner cage defining the fire box and, if provided, other cages of the same temperature have their lower end resting on a foundation while to the upper end of said cage or cages there are connectable the remaining cage heating surfaces of said boiler as well as the flue chamber mantle with insulation, the water-steam separating vessel and a walk-on platform with accessories thereon including the burner system.

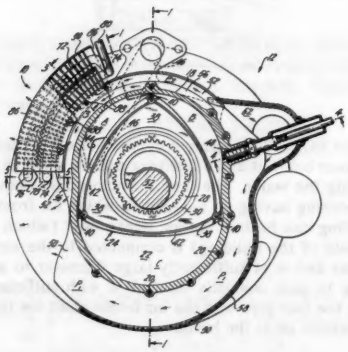


3,659,562

AIR COOLING SYSTEM FOR ROTARY INTERNAL COMBUSTION ENGINE

Charles Jones, Hillsdale, N.J., assignor to Curtiss-Wright Corporation

Filed Jan. 27, 1971, Ser. No. 110,104
Int. Cl. F01p *7/10, 1/00*
U.S. Cl. 123—8.01 **10 Claims**



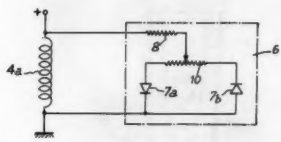
The air cooling system for a rotary piston, internal combustion engine, having a liquid cooled rotor and means defining a divided circumferential external cooling air flow path for flowing air in a first path adjacent the combustion and expansion sectors of the engine and cooling air in the second path adjacent the intake sector of the engine, comprises a liquid heat exchanger secured adjacent the intake sector of the engine and in the second external cooling air flow path so that heated liquid from the engine rotor is passed in indirect heat exchange relation to cooling air flowing through the second path. The heat exchanger is constructed and arranged to provide a pressure drop in the cooling air flow, downstream from the point of divergence of the cooling air flow, to automatically meter a smaller quantity of the cooling air flow in the second flow path than through the first flow path.

3,659,563

INDIVIDUAL CORRECTING SYSTEM FOR THE ELECTRONICALLY CONTROLLED ELECTROMAGNETIC INJECTORS IN INTERNAL COMBUSTION ENGINES

Louis A. Monpetit, L'Etang-La-Ville, France, assignor to Societe des Procedes Modernes d'Injection Sopromi

Filed July 9, 1970, Ser. No. 53,342
Claims priority, application France, Aug. 1, 1969, 6926492
Int. Cl. F02m *52/00*
U.S. Cl. 123—32 EA **2 Claims**



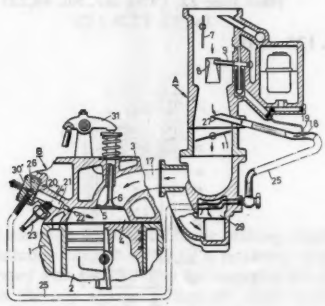
The invention provides an individual correction of the duration of the injection of fuel into any one of the injectors of an internal combustion engine. To this end the signals generated by electronic control means and fed into the solenoid controlling injectors are diverted into a circuit connected across the terminals of the solenoid and including in series an adjustable impedance such as a resistance which may be in parallel with an adjustable capacitance and at least one diode the direction of which defines whether the lag is obtained for the opening or for the closing of the injector. A preferred embodiment of said circuit includes a resistance connected with the slider of a potentiometer the ends of which are connected with diodes connected in opposite directions and in parallel in the circuit so that according to the position of the slider the lag-producing action is predominantly that of one or the other diode.

3,659,564

INTERNAL COMBUSTION ENGINE WITH SUB-COMBUSTION CHAMBER

Toshio Suzuki, Nagoya; Yujiro Oshima, Ichinomiya, and Masao Kataoka, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Hisakata, Showa-ku, Nagoya-shi, Aichi-ken, Japan

Original application Nov. 1, 1968, Ser. No. 772,732, now Patent No. 3,543,736. Divided and this application Mar. 20, 1970, Ser. No. 21,357
Int. Cl. F02b *3/00;* **F02m** *13/04, 23/04*
U.S. Cl. 123—32 SP **2 Claims**



An internal combustion engine having a cylinder, including a main combustion chamber, in combination with a sub-combustion chamber provided with an ignition plug and commu-

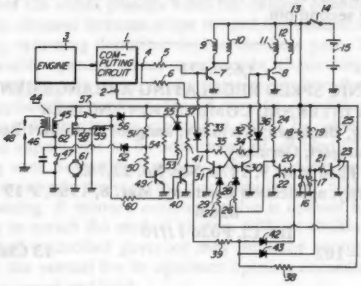
nicating with the main combustion chamber through a small hole in a cylinder wall for jetting out the flame of air-fuel mixture ignited in the sub-combustion chamber to the main combustion chamber, the air-fuel mixture being supplied to the sub-combustion chamber through a suction tube from the same carburetor which feeds the main combustion chamber. The carburetor inlet of said suction tube is positioned upstream of a throttle valve and downstream of a venturi portion of the carburetor. A valve is placed at the outlet of the suction tube to the sub-combustion chamber and this valve may be interconnected with a main valve in the suction manifold leading from the carburetor to the main combustion chamber to move in synchronism therewith and with a piston in the cylinder, or it may be arranged to operate automatically in response to the difference of pressure within the sub-combustion chamber and the suction tube.

3,659,565

FUEL INJECTION CONTROLLING SYSTEM FOR INTERNAL COMBUSTION ENGINE

Ryoji Kasama, and Seiji Suda, both of Hitachi-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 2, 1969, Ser. No. 821,180
Claims priority, application Japan, May 6, 1968, 43/29871
Int. Cl. F02d *5/00*
U.S. Cl. 123—32 EA **4 Claims**



A fuel injection controlling system wherein fuel injectors each thereof associated with each one of cylinders are grouped in correspondence with each two of the cylinders, each group of the fuel injection controlling valves are opened only when it is desired that fuel be injected with respect to one of each corresponding group of cylinders, and at the starting point of the engine all the valves belonging to one group are opened when it is desired that fuel injection be effected with respect to any one of the two cylinders belonging to the corresponding group.

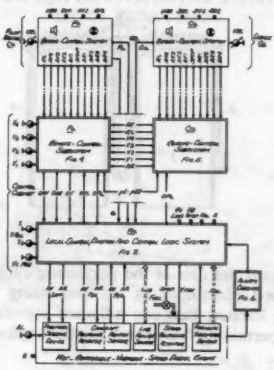
3,659,566

PNEUMATIC DEVICE FOR REMOTE CONTROL AND MONITORING OF A VARIABLE-SPEED, REVERSIBLE DIESEL ENGINE

Marc Edouard Zucca, La Ciotat, France, assignor to Chantiers Navals de la Ciotat, La Ciotat (Bouches-du-Rhone), France, a part interest.

Filed Sept. 10, 1969, Ser. No. 856,598
Claims priority, application France, Sept. 10, 1968, 165629
Int. Cl. F01l *13/02*
U.S. Cl. 123—41 R **24 Claims**

A reversible, variable-speed engine for the propulsion of a ship is controlled by a pneumatic logic system providing selective transmission to the actuators of the engine control members of a running direction order and of a speed order issued from one of a plurality of remote-control stations. Said system provides for proper positioning of the engine cam-



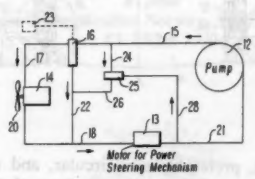
shaft, for successive attempts to pneumatically start the motor and for control of idling and running speed of the engine. Alarm circuits are also provided.

3,659,567

DRIVE MEANS FOR THE COOLING FAN OF AN INTERNAL COMBUSTION ENGINE

Frederick R. Murray, Nantwich, England, assignor to Rolls Royce Limited, Derby, England

Filed July 13, 1970, Ser. No. 54,123
Claims priority, application Great Britain, July 15, 1969, 35,551/69
Int. Cl. F01p *7/02, 7/14, 7/16*
U.S. Cl. 123—41.12 **2 Claims**



A hydraulic drive for the fan of an internal combustion engine in which an existing constant flow supply of hydraulic fluid is used to actuate a hydraulic motor to drive the fan. A system of valves is provided to safeguard the operation of the primary location of use of the hydraulic fluid

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3,659,568

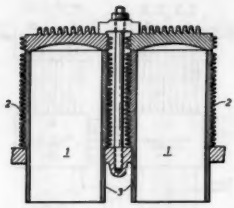
CYLINDERS FOR AIR-COOLED RECIPROCABLE PISTON INTERNAL COMBUSTION ENGINES

Hans-Ulrich Howe, Bensberg-Frankenforst, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne-Deutz, Germany

Filed Dec. 8, 1970, Ser. No. 96,212
Claims priority, application Germany, Dec. 10, 1969, P 19 61 803.2
Int. Cl. F02f *1/06*; F02f *1/30*
U.S. Cl. 123—41.69 **3 Claims**

In an air-cooled reciprocable piston engine having at least two adjacent cylinders with parallel longitudinal axes and transverse fins, in which adjacent fin portions of two adjacent

cylinders are provided with straight substantially parallel edges defining therebetween a narrow gap while the ends of said straight edges merge by curved portions curved in the



direction toward the axis of the pertaining cylinder with the segment-shaped remainder of the pertaining fins, tie rod means being located between adjacent curved portions of respectively pertaining fins of two adjacent cylinders.

3,659,569

LIQUID COOLED CYLINDER SLEEVE, PARTICULARLY FOR INTERNAL COMBUSTION ENGINES

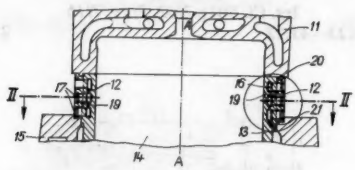
Stephan Mayer, and Rolf Engel, both of Augsburg, Germany, assignors to Maschinenfabrik Augsburg-Nurnberg AG, Augsburg, Germany

Filed Nov. 2, 1970, Ser. No. 86,179

Claims priority, application Germany, Nov. 3, 1969, P 19 55 140.7

Int. Cl. F02f *1/10, 1/14*

U.S. Cl. 123—41.79 **11 Claims**



Cooling tubes, preferably semicircular, and matching in the aggregate approximately the contour of the cylinder sleeve (13), are cast into the sleeve; the tubes (16) are formed with radially extending connecting stubs and with locating means to place them close to the inner wall surface of the liner, and in a region free from axial stresses imposed on the complete cylinder liner-tube casting. Preferably, a group of superimposed tubes are used, interconnected by short riser tubelets. The semi-circular tube sections can have connecting stubs, plugged during casting and, if desired, remaining plugged, extend at the diametrical region of the separation of mold sections used to cast the cylinder sleeve.

3,659,570

CENTRIFUGAL GOVERNOR FOR INJECTION INTERNAL COMBUSTION ENGINES

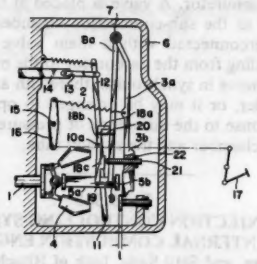
Masao Yoshino, Higashi-Matsuyama, Japan, assignor to Diesel Kiki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 3, 1970, Ser. No. 60,222

Int. Cl. F02d *1/04*

U.S. Cl. 123—98 **2 Claims**

A centrifugal governor for an injection internal combustion engines of the supercharging type. A lever is connected to an interlocking rod to be axially thrusted by the centrifugal force of governor weights, and an oscillating lever opposes the thrust of the interlocking rod and is subjected to the force of a spring. An auxiliary lever has as a supporting point an engaging point with a stopper bolt disposed in the oscillating lever and as acting points first and second pins pivotally connecting the oscillating lever to said interlocking



rod. A follower lever displaces a control rod and a spring stretched between the first mentioned lever and the auxiliary lever so that in the supercharged rotation limits of an engine, the control rod is displaceable through the follower lever by means of the thrust of the interlocking rod and the oscillation of the auxiliary lever with respect to the force of the spring acting on the second pin.

3,659,571

ELECTRONIC SPEED REGULATING ARRANGEMENT FOR INTERNAL COMBUSTION ENGINES

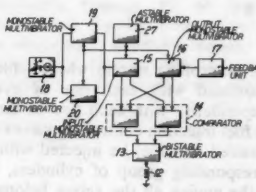
Herbert Lang, Bissingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 9, 1970, Ser. No. 22,743

Claims priority, application Germany, Mar. 8, 1969, P 19 11 826.6

Int. Cl. F02d *11/10*

U.S. Cl. 123—102 **13 Claims**



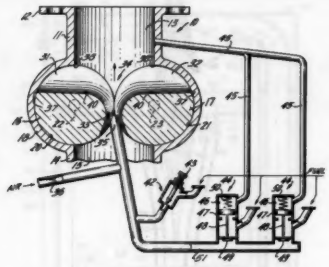
An electronic arrangement for regulating the speed of internal combustion engines, particularly diesel engines. A valve is controlled for regulating the quantity of fuel to be injected into the engine. A bistable multivibrator has its output connected to the valve for controlling the opening thereof. A comparator is connected to the input of the bistable multivibrator and receives output pulses from a first monostable multivibrator. These pulses from the first monostable multivibrator have a duration which is a function of the state or position of the valve. A second monostable multivibrator applies input pulses to the other input of the comparator. These input pulses from the second monostable multivibrator have a duration which is a function of the speed of the engine. The input pulses have a duration which is made variable corresponding to a predetermined speed-load characteristics of the engine.

3,659,572

VARIABLE VENTURI CARBURETORS

Winton J. Pelizzoni, Hagerstown, Md., assignor to Mack Trucks, Inc., Allentown, Pa.

Filed Jan. 29, 1970, Ser. No. 6,773
Int. Cl. F02d *11/02*; F02n *9/08*
U.S. Cl. 123—119 4 Claims



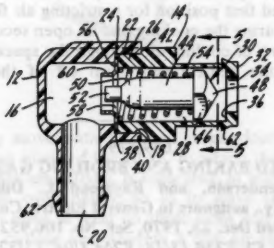
A carburetor having a venturi formed between intake and outlet passages by a pair of rotatable cylinders with aligned, cooperating channels of varying cross section. At the outlet passage, the channels terminate in channel ends conforming to the adjacent passage end. The channels slope gradually to meet the outlet passage when the venturi opening is greatest. The channel bottoms slope toward the central venturi opening, returning deposited fuel to the flow path. The venturi's variable opening serves as a throttle, eliminating the conventional throttle plate. A single jet opens into the venturi and supplies fuel mixture for all throttle conditions, including idle. Idle mixture is controlled either by adjustment of the fuel supply rate or by adjustment of air bled from a premixing vent. Several fuel supply control systems are employable alternatively to vary the fuel supply rate with the venturi opening. A mixture enriching valve is opened for cold starting to enrich the air-fuel mixture without choking. An engine speed controlled governor may limit the venturi opening to set the venturi for its optimum opening according to the engine speed and load.

3,659,573

CRANKCASE VENTILATING VALVE

Raymond G. Bennett, Olympia Fields, Ill., assignor to United Filtration Corporation, Chicago, Ill.

Filed Mar. 19, 1970, Ser. No. 21,081
Int. Cl. F02f *9/02*; F16k *15/02*
U.S. Cl. 123—119 B 5 Claims



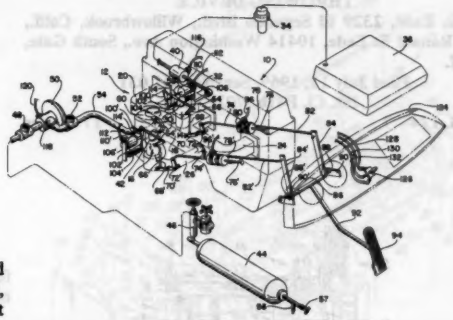
A valve for controlling the crankcase ventilation for an internal combustion engine constructed to be much less expensive than prior valves but to have better performance characteristics due to a unique flow control.

3,659,574

NATURAL GAS POWERED ENGINE

Albert H. Reschke, Chagrin Falls; James E. Dick, Hudson, and Orrin E. Bose, North Canton, all of Ohio, assignors to The East Ohio Gas Company, Cleveland, Ohio

Filed Apr. 13, 1970, Ser. No. 27,781
Int. Cl. F02m *13/08*
U.S. Cl. 123—121 12 Claims



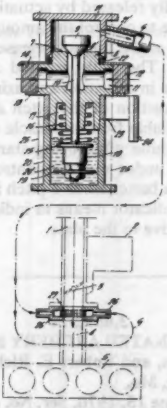
A dual fuel feed apparatus and control for an internal combustion engine adapted to be powered by both natural gas and gasoline. A pair of carburetors are mounted in parallel at the intake manifold. A single throttle control is provided with a switch such that operation of the engine on either natural gas or gasoline may be selected by the operator at his option.

3,659,575

VACUUM BREAKER FOR AUTOMOBILE ENGINES

Leif Lokka, Haerland, Mysen, Norway

Continuation-in-part of application Ser. No. 792,971, Jan. 22, 1969, now abandoned. This application Nov. 9, 1970, Ser. No. 87,686
Claims priority, application Norway, Aug. 3, 1968, 3060/68
Int. Cl. F02m *23/04*
U.S. Cl. 123—124 R 10 Claims



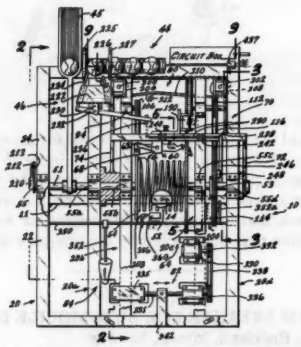
A device for reducing the vacuum in the induction manifold of an engine and supplying additional air to said engine, having a spring-loaded, normally closed, one-way valve adapted to be controlled by the vacuum in the manifold, and a tubing leading from said valve to the manifold of the en-

gine, said valve being substantially loaded by a constant counterforce means and to a smaller extent by spring force, said valve and tubing being arranged to pass air through the valve and tubing to the manifold when the valve is open. In a preferred embodiment, the valve is damped against vibrations.

3,659,576
CENTRIFUGAL SPRING TYPE PROJECTILE THROWING DEVICE

Glen G. Eade, 2329 El Segundo Blvd., Willowbrook, Calif., and Ronald E. Eade, 10414 Washington Ave., South Gate, Calif.

Filed July 11, 1969, Ser. No. 841,031
Int. Cl. F41b *3/02, 7/00*
U.S. Cl. 124—7 **17 Claims**



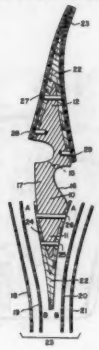
A projectile throwing machine exemplified herein as a baseball pitching machine. A throwing arm is driven by a torsion spring which is wound up by a motor and which is automatically triggered for releasing the throwing arm. The trigger is automatically released by actuating levers which are remotely controllable to control the amount of power, that is, torsion in the spring at the time of release to thereby control the speed of pitch. The balls are fed automatically. The machine is adjustable in elevation and azimuth to control the height and lateral position of the pitch and all adjustments are remotely controllable from a console and subject to programming. The machine after being started will repeatedly cycle automatically under remote control. Means are provided to indicate to a batter when a pitch is about to be made and also there are indicator means to indicate the position of the pitched ball relative to the plate.

3,659,577
LAMINATED ARCHERY BOW

James R. Richardson, and Robert E. Richardson, both of R. R. 3, Reeds Spring, Mo.

Filed June 15, 1970, Ser. No. 46,387
Claims priority, application Great Britain, July 21, 1969, 36,549/69
Int. Cl. F41b *5/00*
U.S. Cl. 124—24 **5 Claims**

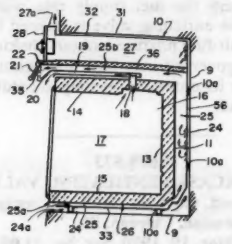
A composite bow having a metallic central handle portion for increased accuracy and strength, and laminated wood and fiber glass limb portions. The two laminated limbs are joined to the handle by a transition member which absorbs the difference in the modulus of elasticity between the relative rigid handle and the flexible limb portions.



3,659,578
VENT FOR A SELF-CLEANING OVEN

James E. Davis, and Harold L. Frick, both of Marion, Ohio, assignors to Whirlpool Corporation

Filed Dec. 15, 1970, Ser. No. 98,290
Int. Cl. F24c *15/32*
U.S. Cl. 126—21 R **10 Claims**



A vent structure for venting an air space around the cavity of a self-cleaning oven in which food is cooked with the vent structure including a movable damper movable between a relatively closed first position for restricting air flow through the air space during the cooking and an open second position to facilitate flow of cooling air through the space during the high temperature self-cleaning burn off of the food soil deposits.

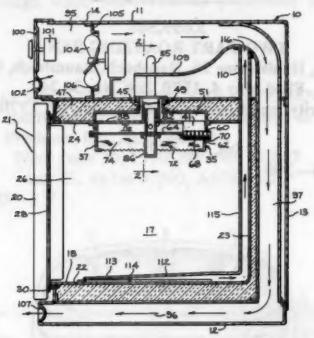
3,659,579
COMBINED BAKING AND BROILING GAS OVEN

Wayne L. Henderson, and Raymond L. Dills, both of Louisville, Ky., assignors to General Electric Company

Filed Dec. 23, 1970, Ser. No. 100,952
Int. Cl. F23d *13/14;* **F24c** *3/04, 15/32*
U.S. Cl. 126—21 A **14 Claims**

A single cavity gas cooking oven with a combined baking and broiling gas burner mounted adjacent the top wall of the oven liner. The burner has a top baking zone and a bottom broiling zone and an adjustable valve for supplying gas either

to the top zone or the bottom zone. Air channels are formed above the oven liner, down the back of the oven liner as well as beneath the oven liner. A fan in the air channels draws air in the top front and discharges it out the bottom front of the oven. An air inlet opening is formed in the top wall of the oven liner to communicate with the top air channel and



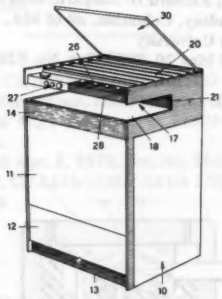
supply a flow of secondary air over the burner. An oven exhaust vent is formed adjacent the bottom wall of the oven liner. A duct connects with the exhaust vent and extends across the floor of the oven liner, up the back wall and through the top wall to discharge the oven gases into the top air channel due to a venturi effect where they mix and are eventually discharged from the oven.

3,659,580

COOKING STOVE

Lamberto Mazza, Pordenone, Italy, assignor to Becchi S.p.A., Forli, Italy

Filed Nov. 25, 1969, Ser. No. 879,819
Claims priority, application Italy, Nov. 28, 1969, 24318 A/68
Int. Cl. F24c *15/00*
U.S. Cl. 126—37 R **4 Claims**



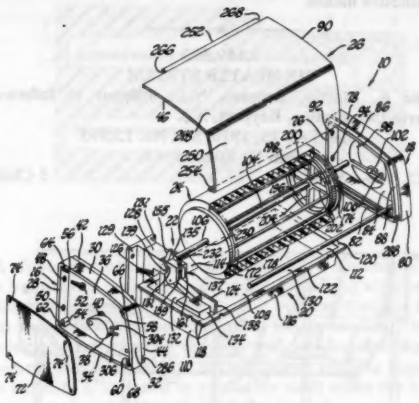
A cooking stove with an oven is provided wherein an upper working plane of the stove, to which the control taps and/or switches are affixed, is separated, at least in the front part, from an oven below, so as to leave cooking space therebetween open at least on three sides and communicating with the outside and wherein a free air circulation can taken place. The provision of the cooling space provides a very effective and economical method of heat dissipation from the oven top and insulating the oven top from the cooking range or the working top where the ovens are of self-cleaning type in which very high operating temperatures and associated high heat occur in the self-cleaning cycle.

3,659,581

HUMIDIFIER ASSEMBLY

Russell W. Geisler, Bloomfield Hills, and John W. Wheaton, Birmingham, both of Mich., assignors to G & W Products Company, Madison Heights, Mich.

Filed June 18, 1970, Ser. No. 47,344
Int. Cl. F24f *3/14*
U.S. Cl. 126—113 **11 Claims**



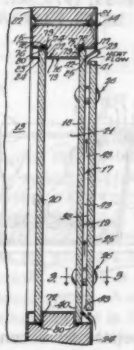
A humidifier assembly for use with a related hot air heating system has separate end support members individually mountable, in spaced relation, to a portion of the heating system; the end supports in turn support a separate lower water pan, a water carrying rotatable drum assembly which is also removable as a subassembly and a detachable cover assembly for enclosing the operating components of the humidifier including a water inlet assembly which, in one form of the invention is separately secured to the related heating system and in another form of the invention is detachably secured to the separate lower water pan.

3,659,582

OVEN CABINET CONSTRUCTION

Harold R. Morgan, Dolton, Ill., assignor to Dearborn Glass Company

Filed June 10, 1970, Ser. No. 45,094
Int. Cl. F23m *7/00*
U.S. Cl. 126—198 **19 Claims**



An oven cabinet construction having a door provided with a window structure having a front light. An auxiliary light is

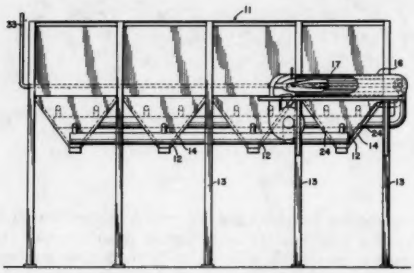
mounted on the front light of the window structure and is spaced forwardly thereof to provide an air flow passage therebetween thereby maintaining the auxiliary light at a low temperature notwithstanding the existence of a high temperature within the oven to prevent injury to a person accidentally engaging the same. The auxiliary light may be attached or mounted to the oven window structure by a number of different mounting means. The oven window structure is secured in the door by an improved mounting frame wherein the glass is retained by a combination sealing and adhesive means.

3,659,583

BIN HEATER SYSTEM

Charles K. Martin, Boonton, N.J., assignor to Infern-O-Therm Corporation, Keyport, N.J.

Filed Feb. 25, 1970, Ser. No. 13,995
Int. Cl. E01c *19/45*
U.S. Cl. 126—343.5 A **5 Claims**



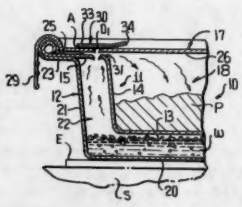
A bin heater system for aggregate bins and the like having inclined wall hoppers comprising a closed, recirculating hot air system for passage through jackets on the hoppers in which the heated, working air is maintained separate from flue gas eminating from an oil burning primary fire tube, the primary fire tube having a plurality of axially extending, radial fins projecting into a concentric, working air heating tube connected to the hopper jackets through manifolds; and a flue gas conduit passing through each bin discharging flue gases to the atmosphere outside of the bins.

3,659,584

STOVE TOP HEATING CONTAINERS

Diane J. Doyle, Western Springs, and Harry A. Peyser, Olympia, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Filed Feb. 11, 1970, Ser. No. 10,340
Int. Cl. F24d *1/00*
U.S. Cl. 126—369 **13 Claims**



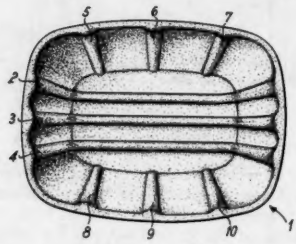
This disclosure relates to a container of the "double-boiler" type in which an edible product is packaged within an inner chamber and water is packaged within an outer chamber with the chambers initially not being in fluid communication. A lid and a portion of the inner chamber are pierced after the removal of an adhesive tape from the lid which is reapplied to cover the pierced opening of the lid. Upon application of heat to the container steam emitted from the water enters the interior chamber but is precluded from exiting to atmosphere by the reapplied adhesive tape which, however, will release to perform a valving function upon pressure build-up in the product and/or liquid chamber.

3,659,585

TWO-PART ROASTING PAN

Eduard Bay, Hohlstrasse 26, Ransbach, Baumbach, Germany

Filed May 4, 1970, Ser. No. 34,241
Claims priority, application Germany, Jan. 17, 1970, G 70 01 434.5
Int. Cl. A47j *37/00*
U.S. Cl. 126—390 **2 Claims**



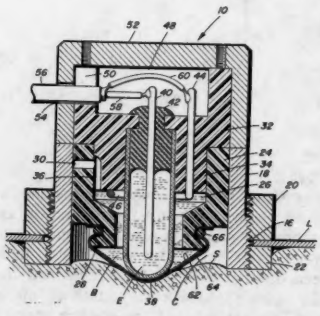
A two-part roasting pan made of unglazed porous earthenware has the inner surface of its lower part, namely the bottom and the side walls thereof, provided with integral spaced parallel ribs which engage and support a roast placed in the roasting pan.

3,659,586

PERCUTANEOUS CARBON DIOXIDE SENSOR AND PROCESS FOR MEASURING PULMONARY EFFICIENCY

Richard J. Johns; Richard H. Shepard, both of Baltimore, and Wardell J. Lindsay, Columbia, all of Md., assignors to The Johns Hopkins University

Filed May 20, 1969, Ser. No. 826,189
Int. Cl. A61b *5/00*
U.S. Cl. 128—2 E **8 Claims**



A sensing device including a receiving and measuring vessel for determining tissue carbon dioxide of a living body is

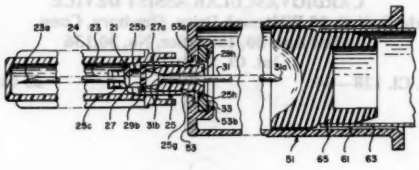
disclosed. The skin-permeating CO_2 gas is directly introduced to a liquid filled cup. A gas-permeable, membrane-faced, pH sensing electrode is in communication with this liquid and indicates continuously the concentration of CO_2 on a meter to give a function of effective alveolar ventilation. A lead plate mount adapts to body member contour and functions as a thermal filter mass to reduce fluctuations in the readings. Also, a process is disclosed for measuring pulmonary efficiency through ionic measurement proximate the human skin.

3,659,587

VALVED CONNECTOR ARRANGEMENT

Brian E. Baldwin, Wilmette, Ill., assignor to Affiliated Hospital Products, Inc., St. Louis, Mo.

Filed June 30, 1970, Ser. No. 51,047
Int. Cl. A61m *05/00*; A61b *05/10*
U.S. Cl. 128—2 F **13 Claims**



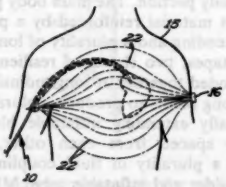
A valved connector arrangement having a pair of tubes and a slitted transverse elastic disk partition normally separating and disconnecting the interior of the two tubes, one of the two tubes being slidable toward and away from the slitted disk partition to effect mechanical opening and permit self-reclosing of the slitted partition. In the embodiment, the other tube is fixed, and the two tubes are pointed at their outer ends to enable their use in a multiple sample blood collecting needle arrangement, including a removable vacuum collecting container with a rubber stopper engageable by one of the pointed tubes.

3,659,588

CATHETER APPARATUS

Alan R. Kahn, Morrestown, and Florence A. Stroebel, Maple Shade, both of N.J., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 8, 1970, Ser. No. 26,697
Int. Cl. A61b *05/02*; A61m *25/00*
U.S. Cl. 128—2 R **7 Claims**



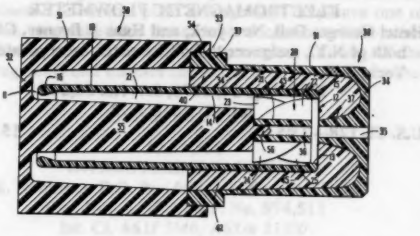
A catheter having walls of which at least a portion is electrically conductive and has an electrical resistivity approximately equal to the electrical resistivity of blood.

3,659,589

SPIROGRAPH MOUTHPIECE

Jack R. Lambert, 42 The Great Road, Bedford, Mass.

Continuation-in-part of application Ser. No. 861,539, Aug. 21, 1969. This application Sept. 15, 1969, Ser. No. 857,876
Int. Cl. A61b *5/08*
U.S. Cl. 128—2.08 **10 Claims**



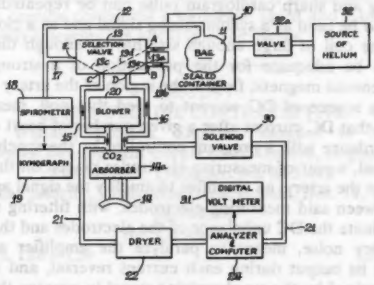
A disposable mouthpiece for use with a spirometer and like instruments having an air conduit containing an impeller, which is supported within the conduit by a cap that also functions to antiseptically seal one end of the air conduit. The air conduit is adapted to be inserted into a spirometer for engagement of a drive shaft of the spirometer with the impeller. The impeller is designed to rotate the shaft when the cap is removed and air is blown through the conduit.

3,659,590

RESPIRATION TESTING SYSTEM

William C. Jones, Elmhurst, Ill., and Joseph Mallen Kootsey, Durham, N.C., assignors to Jones Medical Instrument Company, Oakbrook, Del.

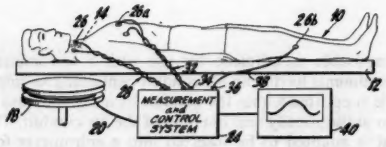
Filed Oct. 13, 1969, Ser. No. 865,754
Int. Cl. A61b *5/08*
U.S. Cl. 128—2.08 **8 Claims**



In a system for measuring the various desired parameters of a person's respiratory system, the person breathes into a closed volume of gas having a known concentration of helium until the concentration of helium in the enclosure and his lungs reaches an equilibrium. A helium analyzer is included in the system; and when the subject's breathing reaches the end of a resting expiration, a valve is turned to switch his breathing out of the closed system. A solenoid is also energized to maintain the volume of gas in the analyzer at a constant value; and computation circuitry receives the analyzer signal which is representative of the new helium concentration in the closed system to compute the various desired respiratory parameters of the subject's respiratory system in-

cluding Functional Residual Capacity, Total Lung Capacity, or Residual Volume as called for by the operator. Further, the circuitry will compute the percentage of any of these parameters relative to a norm value for that parameter; and all computation results are preferably displayed on a digital voltmeter for facility of reading and recording.

3,659,591
ELECTROMAGNETIC FLOWMETER
Henri Georges Doll, New york, and Hans J. Broner, Glendale, both of N.Y., assignors to Doll Research Incorporated, New York, N.Y.
Filed Aug. 24, 1970, Ser. No. 66,240
Int. Cl. A61b 5/02
U.S. Cl. 128—2.05 F **15 Claims**

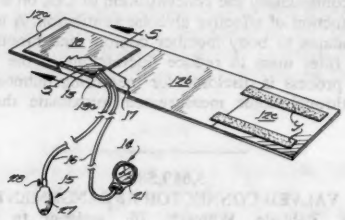


A noninvasive electromagnetic flowmeter particularly adapted to measure arterial blood flow in human beings is provided. A homogenous magnetic field is produced in the region of the artery under measurement by means of at least one large coil remote from the skin. Blood flow induced signals are sensed by electrodes placed on the skin adjacent the artery and fed to a measurement and control circuit. Electrocardiogram signals sensed by a second pair of electrodes placed on the body near the heart synchronize the operation of this system.

A preferred embodiment of control and measurement system comprises a pair of auxiliary electrodes located where a strong and sharp cardiogram pulse can be repeatedly obtained to be used as a synchronizing signal and as a clock, at least one coil of large enough size having enough turns of wire to be adequate for the production of a strong and homogeneous magnetic field in the region of the artery under study, a source of DC current to feed that coil, means to reverse that DC current after a given number of heart cycles in accordance with a program controlled by the synchronizing signal, a pair of measuring electrodes placed on the skin adjacent the artery, an amplifier to amplify the signal appearing between said measuring electrodes, with filtering means to eliminate the DC unbalance of the electrodes and the high frequency noise, means to paralyze the amplifier and to reverse its output during each current reversal, and means synchronized by the synchronizing signal to average the pulsatile signal measured between the measuring electrodes during successive heart cycles so as to extract the repetitive wave shape of the blood flow pulses from the large random noise in which it is otherwise buried.

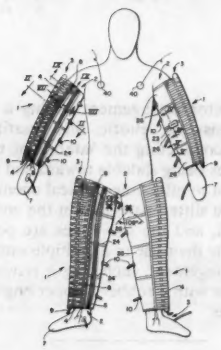
3,659,592
BLOOD PRESSURE MEASURING DEVICE
Zygmunt Natkanski, 6609 W. Melrose Street, Chicago, Ill.
Filed Sept. 4, 1970, Ser. No. 69,627
Int. Cl. A61b 5/02
U.S. Cl. 128—2.05 C **8 Claims**

A blood pressure measuring device is provided which is self-contained and includes an arm-wrapping member having a pouch formed therein for storage of various components of the device without requiring disconnection of said components. When not in use the device may be formed into a



compact roll. Complemental fastening means are provided on the arm-wrapping member for securing the latter in either an arm-wrapping position or in the compact roll position.

3,659,593
CARDIOVASCULAR ASSIST DEVICE
Edwin G. Vail, 20 Whitcomb Drive, Simsbury, Conn.
Filed Apr. 20, 1970, Ser. No. 30,136
Int. Cl. A61h 7/00
U.S. Cl. 128—64 **23 Claims**



A cardiovascular assist device for producing an inwardly orienting pulsating pressure circumferentially to the entire length of each extremity of a patient, including a main body portion surrounding the extremity and a lateral body portion being inflatable to tightly constrict the main body portion about the extremity before pulsation. The lateral body portion includes a single inflatable tube having connecting tapes extending substantially entirely circumferentially therearound and oppositely circumferentially at least partially around said main body portion to terminal ends secured to the main body portion. The main body portion includes an outer restraint material reinforced by a plurality of circumferentially extending and a plurality of longitudinally extending restraint tapes, two sheets of resilient material circumferentially bonded together at longitudinal intervals and longitudinally along seams to produce a plurality of overlapping circumferentially extending inflatable bladders, which are longitudinally spaced from each other, an inner pouch material and a plurality of fluid couplings communicating with each bladder and inflatable tube. Mittens are provided to close one end of each main body portion and similarly constructed to provide an inwardly pulsating pressure to the respective hand or foot of the patient. The main body portions and mittens may be donned and doffed by means of respective longitudinally extending fasteners, and thereafter manually circumferentially constricted by means of longitu-

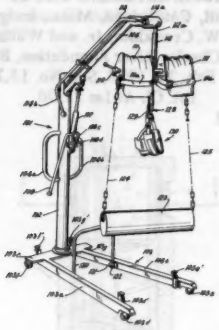
dinally extending lacings prior to the pressure constriction caused by inflating the lateral body portion.

3,659,594

APPARATUS FOR MANIPULATING THE VERTEBRAL COLUMN OF HUMAN PATIENTS

Raymond Schwab, Freiherrnweg 13, 43 Essen, Germany

Filed June 15, 1970, Ser. No. 45,978
Claims priority, application Germany, Feb. 4, 1970, P 20 04 932.5
Int. Cl. A61f 5/00
U.S. Cl. 128—69 7 Claims



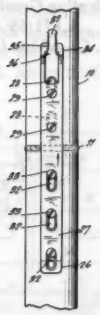
An apparatus for facilitating manipulation of the body of a human patient for the treatment of vertebral disorders comprises an upright support from which a pivotal arm is cantilevered and has at its ends a suspended traverse. The traverse is provided with knee-supporting shells or saddles from which the patient may be suspended head downward to permit manipulation. The traverse may also carry a roll or drum adapted to carry the patient in a bent-over condition to permit manipulation of the spine.

3,659,595

COMPENSATING PLATES FOR BONE FRACTURES

Edward J. Haboush, 238 Hilton Avenue, Hempstead, N.Y.

Filed Oct. 22, 1969, Ser. No. 868,451
Int. Cl. A61f 5/04
U.S. Cl. 128—92 D 3 Claims



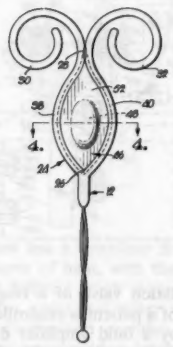
Single or double plates are provided for application across the fracture site of fractured bones and wherein the single or double plates are constructed to allow for compressional and tensional forces acting on the fractured bone. When a single plate is used it is rigidly secured at one end on one side of the fracture site and at the other end by means of elongated apertures for fastening the plate on the other side of the fracture site while allowing for relative movement of the bone pieces and fragments and providing for locking the bone fragments in increasingly closer relationship as healing occurs. When two plates are used they operate in the same general functional manner, but the lower plate is provided with elongated openings on one side of the fracture site and the upper plate is provided with elongated openings on the other side of the fracture site and one plate, preferably the lower plate, is provided with a serrated jaw for the reception of a serrated tongue of the other plate which is bent into the same plane. The double plate arrangement may have one of the plates channelled for the slidable reception of the other plate. Use of the plates aids and promotes knitting of the bone fragments and enables the patients to be rapidly ambulatory.

3,659,596

INTRAUTERINE ELEMENT

Ralph R. Robinson, P.O. Box 668, Middlesboro, Ky.

Filed Nov. 6, 1969, Ser. No. 874,511
Int. Cl. A61f 5/46; A61m 31/00
U.S. Cl. 128—130 4 Claims



An intrauterine contraceptive device has a continuous loop as a part thereof which is closed by a membrane of thin, pliable material. By use of a double layer and by selection of a permeable material for the membrane, it serves also to support a capsule containing a biological agent and a substance for slowly releasing the agent into the uterus.

3,659,597

INTRA-UTERINE CONTRACEPTIVE

David Wolfers, London, England, assignor to National Research Development Corporation, London, England

Filed Dec. 9, 1969, Ser. No. 883,449
Claims priority, application Great Britain, Dec. 11, 1968, 58,969/68
Int. Cl. A61f 5/46
U.S. Cl. 128—130 13 Claims

An intra-uterine contraceptive device is provided to fit the parturient uterus and gradually accommodate the involutionary process in a predetermined manner. The device is

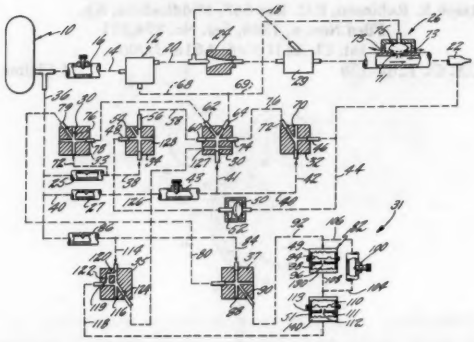
contractable in self-tracking manner by longitudinally progressive sliding engagement of one end of an elongate flexible member in the other end thereof. More particularly such a device is formed by a suitably dimensioned tapered tube.

3,659,598

RESPIRATOR WITH FLUID AMPLIFIERS WITH FLUID TIMER

Joseph C. Peters, East Hartford, and Hermann Ziermann, Cheshire, both of Conn., assignors to General Medical Corporation

Filed June 17, 1969, Ser. No. 834,004
Int. Cl. A62b *7/04*
U.S. Cl. 128—145.8 **8 Claims**



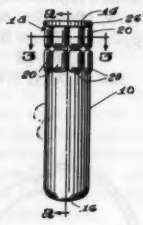
An on-off inhalation valve of a respirator for admitting fluid to the lungs of a patient is controlled by a flip-flop fluid amplifier driven by a fluid amplifier during the exhalation cycle and by another fluid amplifier during the inhalation cycle and including a fluid timer for controlling the length of time of the pause between exhalation and inhalation.

3,659,599

OCCLUSIVE DRESSING

Gladys M. McLaughlin, 8 Westerly Street, Jamaica Plain, Mass.

Filed Sept. 30, 1969, Ser. No. 862,395
Int. Cl. A61f *13/10*
U.S. Cl. 128—157 **3 Claims**



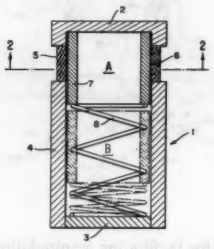
The present occlusive dressing is particularly adapted to provide an airtight waterproof dressing for use in covering so-called "wet soak" bandages and other dressings which include salves and ointments used in the treatment of various skin diseases wherein it is important that air be excluded from the dressed area and moisture and heat retained. The dressing comprises a relatively thin, one-piece latex tube closed at one end and open at the other end and provided with an integral novel retaining band at the open end thereof. The band comprises a plurality of ribs intersecting to form a series of pockets or suction cups. The dressing is rolled or drawn over the dressed wound, for example an injured finger, and is held in position by the suctionlike effect of the pockets against the finger. The ribs provide in effect a series of dam-like ridges which aid in rendering the dressing airtight. No additional tape or other means is required to hold the dressing in position covering the infected area.

3,659,600

MAGNETICALLY OPERATED CAPSULE FOR ADMINISTERING DRUGS

Edward W. Merrill, Cambridge, Mass., assignor to Hans H. Estin, Leonard W. Cronkhite, Jr. and William W. Wolbach, Trustees of the Charles River Foundation, Boston, Mass.

Filed Feb. 24, 1970, Ser. No. 13,278
Int. Cl. A61m *31/00*
U.S. Cl. 128—172 **3 Claims**



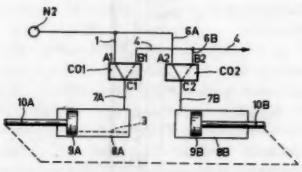
An implantable capsule for delivering drugs when subjected to a magnetic force outside the body and controlled by the patient. The capsule has a means movable under a magnetic force to effect contact of the medicament in the capsule with a drug-permeable wall. When contacted, the drug diffuses through the wall into the body. When it is desired to cease drug administration, the capsule is subjected to an opposite magnetic force to seal the permeable wall from contact with the drug.

3,659,601

VAPORIZERS FOR MEDICAL RESPIRATORS

John Andrew Bushman, Cambridge, England, assignor to Pye Limited, Cambridge, England

Filed Jan. 27, 1970, Ser. No. 6,195
Claims priority, application Great Britain, Feb. 5, 1969, 6,171/69
Int. Cl. A61m *15/00*
U.S. Cl. 128—188 **9 Claims**



A vaporizer for use in a medical respirator for supplying a mixture of patient gas and vapor to a patient during an inspiratory period of the respirator. The vaporizer has a source of patient gas connected thereto and a pair of sealed vessels, each having a connection to the source of gas. When the gas is fed to the vessel containing the liquid, the gas therein becomes saturated. A changeover switch is provided in the connection to the vessels so that alternately the supply of gas is fed to the vessels and to a patient via a patient supply con-

nection. Each vessel is provided with means for adjusting the volume therein so as to control the percentage of saturation of the gas which is passed to the patient from the vessels and so as to control the total volume of gas passed to the patient during each inspiratory period.

3,659,602

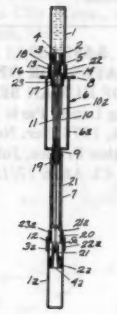
TWO COMPONENT SYRINGE

Harold S. Cloyd, Erie, Pa., assignor to Nosco Plastics, Incorporated, Erie, Pa.

Continuation of application Ser. No. 848,446, Aug. 8, 1969, now abandoned. This application Dec. 30, 1970, Ser. No. 94,942

Int. Cl. A61m *05/18*

U.S. Cl. 128—220 **6 Claims**



A two component syringe having two vials each containing a single component. A needle is mounted in the syringe and is arranged to interconnect the vials prior to mixing the contents thereof. One vial is mounted on a holder having a needle hub. The other vial is mounted on an adapter sleeve removably mounted on the needle hub. The adapter sleeve and the other vial are removed after the ingredients have been mixed, leaving the first vial with the associated needle in readiness for injection.

3,659,603

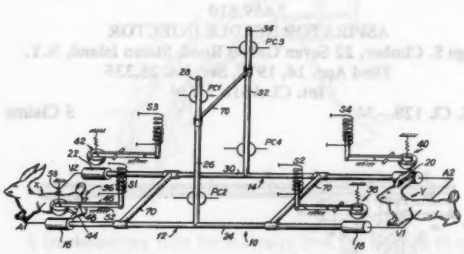
PARABIOSIS ASSEMBLY

Placido R. Oses, Fahey Medical Center, 581 Golf Road, Des Plaines, Ill.

Continuation-in-part of application Ser. No. 608,190, Jan. 9, 1967, now abandoned. This application July 16, 1969, Ser. No. 842,155

Int. Cl. A61m *05/00*

U.S. Cl. 128—214 B **5 Claims**



A parabiosis assembly for bringing about exchange of blood between a pair of beings. The arterial system of one being is interconnected with the venous system of the other being while the arterial system of this other being is interconnected with the venous system of the one being. The interconnecting structure provides for flow of a given quantity of blood from the arterial system to the venous system whereupon the cycle is repeated. The only force relied upon to move the blood between the beings is the pressure of the blood itself in the arterial systems, so that the use of pumps or other flow-producing devices is not required.

3,659,604

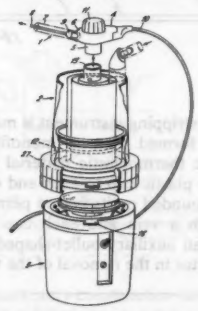
HUMIDIFYING MEANS

Alfred W. Melville; David H. O'Hare, and Christopher G. Brickell, all of Auckland, New Zealand, assignors to Fisher & Paykel Limited, Auckland, New Zealand

Filed Mar. 30, 1970, Ser. No. 23,770

Int. Cl. A61m *15/00*

U.S. Cl. 128—212 **9 Claims**



A humidifying means has a container for water which is removable from a source of heat, with the container being provided with a cover defining an air space with an inlet for gases and an outlet for gases and water vapor, the whole being removable for sterilization or other purposes. Temperature control means are provided externally of the container to control the temperature of the water in the container. A hose connects the outlet for gases and water vapor to a patient undergoing assisted or artificial respiration and this hose has a heating element therein arranged longitudinally to reduce or obviate condensation in the hose.

3,659,605

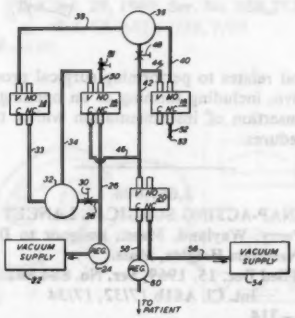
PNEUMATIC SUCTION SYSTEM

Ulrich Sielaff, McFarland, Wis., assignor to Airco, Inc.,, New York, N.Y.

Filed Apr. 8, 1970, Ser. No. 26,480

Int. Cl. A61m *1/00*

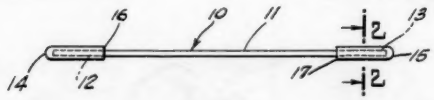
U.S. Cl. 128—276 **6 Claims**



A pneumatic suction system having extreme reliability comprising a plurality of interconnected, vacuum actuated

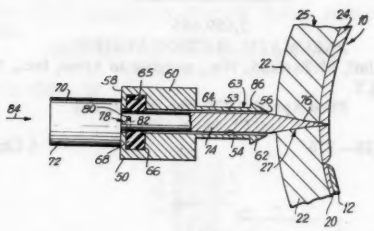
modular switches adapted to be connected to a vacuum source to provide an intermittent vacuum source having controllable timed intervals for withdrawing fluids from a patient.

3,659,606
VEIN STRIPPING INSTRUMENT
Harry G. Reimels, Braintree, Mass., assignor to Codman & Shurtleff, Inc., Randolph, Mass.
Filed Feb. 19, 1970, Ser. No. 12,795
Int. Cl. A61b *17/00*
U.S. Cl. 128—303 R **1 Claim**



A surgical vein stripping instrument is made by providing a length of cable formed from a monofilament of axially oriented synthetic thermoplastic material and ultrasonically welding a tubular plastic cap to each end of the cable. Each cap is smoothly rounded on its end to permit free passage of the cable through a vein and each cap is adapted to be secured to both an auxiliary bullet-shaped tip and a handle for aiding the doctor in the removal of the vein.

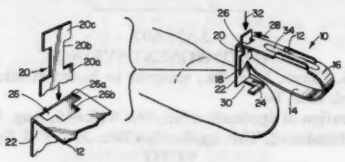
3,659,607
METHOD FOR PERFORMING SURGICAL PROCEDURES ON THE EYE
Anton Banko, Brooklyn, N.Y., assignor to Surgical Design Corporation, Long Island, N.Y.
Original application Sept. 16, 1968, Ser. No. 762,286, now Patent No. 3,528,425. Divided and this application Apr. 6, 1970, Ser. No. 25,669
Int. Cl. A61b *17/32*
U.S. Cl. 128—305 **16 Claims**



The method relates to performing surgical procedures on the eye in vivo, including forming of an opening therein to permit the insertion of instrumentation within the eye for various procedures.

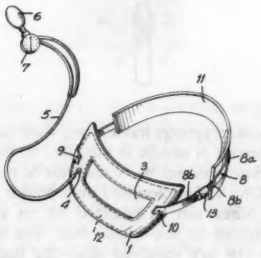
3,659,608
SNAP-ACTING SURGICAL LANCET
Wesley G. Perry, Wayland, Mass., assignor to Damon Corporation, Needham Heights, Mass.
Filed Dec. 15, 1969, Ser. No. 884,861
Int. Cl. A61b *17/32*, *17/34*
U.S. Cl. 128—314 **15 Claims**

A new snap-acting surgical lancet has a spring urging the forward ends of two opposed arms apart. A lower of the two arms carries a downwardly protruding lancing blade. Latching elements on the two arms hold them cocked with their front ends close together, and are releasable to allow the spring to snap the end of the lower arm downward, carrying the blade downward to lance the skin. A stop carried on

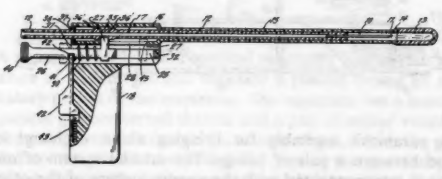


one arm engages the other arm to limit this snap-apart travel of the arm ends. A single piece of spring material is readily formed to provide all of the foregoing structure, thereby providing a one-piece lancet.

3,659,609
HEMOSTATIC APPARATUS FOR OPERATIONS ON THE HEAD OF HUMAN BEINGS
Jean Arouete, 67 Building Lanes, Paris 160, France
Filed June 4, 1970, Ser. No. 43,544
Claims priority, application France, July 29, 1969, 6925939
Int. Cl. A61b *17/12*
U.S. Cl. 128—325 **13 Claims**



Hemostatic apparatus is disclosed for operations on the head of a human being, more particularly for scalp grafts. The apparatus includes a frame of plate form provided with a strap fastener for attachment on the head of a patient, the plate being rectangular with an opening therein. Mounted on the plate is a flexible tube of loop form encircling the opening and adapted for being pressurized to exert the necessary pressure on the patient's head to render it free of blood in the region of the opening in the plate whereby scalp grafts or the like can be performed within the field of the opening in the plate without bleeding.

3,659,610
ASPIRATOR NEEDLE INJECTOR
Hugo S. Cimber, 22 Seven Gables Road, Staten Island, N.Y.
Filed Apr. 14, 1970, Ser. No. 28,335
Int. Cl. A61b *17/34*
U.S. Cl. 128—347 **5 Claims**

A disposable sterilizable aspirator needle and operating mechanism therefor in which a hollow disposable needle is

supported in a hollow barrel for controlled spring loaded injection into the body for a predetermined distance. The barrel is secured to a pistol grip and the hollow needle is secured to a plunger in the pistol grip which is spring biased toward the injecting position and retained against movement under the spring bias by a latch mechanism which may be manually released. The needle is fully recessed in the barrel so that the barrel end may be placed against the body at the appropriate location and is extruded under the spring bias from the barrel end on release of the latch. The hollow needle may, as required, receive a catheter and a catheter stiffening wire. More specifically, the needle barrel and the pistol grip operating mechanism including the latch mechanism are separable.

3,659,611

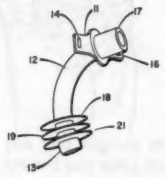
TRACHEAL TUBE SEAL

Don R. Miller, Kansas City, Kans., assignor to Dow Corning Corporation, Midland, Mich.

Filed Dec. 15, 1969, Ser. No. 884,869

Int. Cl. A61m *25/02*, *3/00*

U.S. Cl. 128—351 **5 Claims**



Improvement in tracheostomy and endotracheal tubes for effecting a substantial air seal between the tube and the trachea. There is provided on the periphery of the indwelling portion of the device a series of thin resilient, circular flanges, of silicone rubber, for example. The flanges bend for insertion and withdrawal and engage the wall of the trachea to form an air seal therewith.

3,659,612

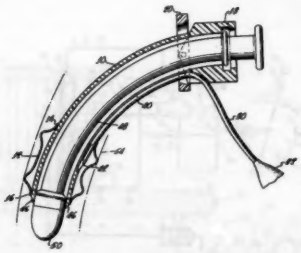
TRACHEOSTOMY TUBE

Donald P. Shiley, Santa Ana, and Bruce E. Fettel, Diamond Bar, both of Calif., assignors to Donald P. Shiley, Santa Ana, Calif.

Continuation-in-part of application Ser. No. 863,229, Oct. 2, 1969. This application Nov. 12, 1970, Ser. No. 88,591

Int. Cl. A61m *25/02*; A61b *17/24*

U.S. Cl. 128—351 **15 Claims**



A tracheostomy tube for insertion into the trachea to support breathing having a concave sealing balloon which, when inflated, assumes a cylindrical shape and therefore forms a seal between the cannula and the trachea over an extended axial length, the tracheostomy tube also incorporating an inner cannula which is disposed within and throughout the entire length of the outer cannula and is connected to the outer cannula by a removable fitting which assures a pneumatic seal between the two cannulas, the tracheostomy tube also including a rotatable connector which allows attachment to respiration support equipment in a variety of angular positions. The portion of the tracheostomy tube which extends outside of the patient is hinged to a swivel neck flange which makes the tube adaptable to various anatomies. The tube leading to the sealing balloon is controlled by an isolation valve outside of the patient which allows quick sealing and releasing of the pressure within the sealing balloon.

3,659,613

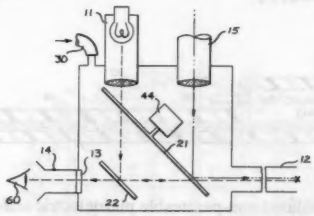
LASER ACCESSORY FOR SURGICAL APPLICATION

Herbert C. Bredemeier, Sherborn, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed June 30, 1969, Ser. No. 837,690

Int. Cl. A61n *5/00*

U.S. Cl. 128—395 **5 Claims**



A surgical laser accessory construction comprising an elongated tubular member defining an unobstructed path for conducting optical energy to a relatively inaccessible location within a body cavity and optical means for directing the infra-red radiation of a CO_2 pulsed laser to a location within said body cavity while providing visible light to be directed to said body cavity location and for allowing an operator of the device at such times to continuously monitor said location within the body cavity during treatment by the laser radiation, said optical means including a rotatable disc for enabling the laser energy at substantially full strength to be directed to said body location and said location simultaneously viewed in visible light by the operator of the device. The construction also includes means for changing the body cavity location being treated as well as pressurized housing means for enabling air to be directed under pressure into said body cavity.

3,659,614

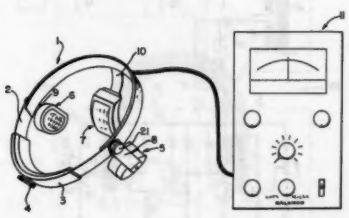
ADJUSTABLE HEADBAND CARRYING ELECTRODES FOR ELECTRICALLY STIMULATING THE FACIAL AND MANDIBULAR NERVES

Bernard Jankelson, Medical-Dental Building, Seattle, Wash.

Filed Dec. 29, 1969, Ser. No. 888,272

Int. Cl. A61n *1/18*, *1/04*

U.S. Cl. 128—410 **4 Claims**



Electrodes capable of conforming to irregular surfaces include a cup-shaped housing having an open end, a pad of electrically conductive coiled metallic wire in the housing, a

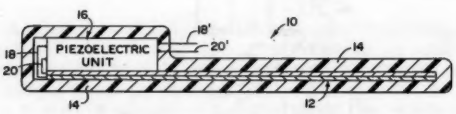
felt of porous material over the metallic wire pad, and a mounting ring contacting the wire pad and felt around their circumference to hold the pad and felt in place in the housing. Three electrodes, two input electrodes and a dispersal electrode, of the type described are attached through electrically conductive support members to an adjustable headband. The two input electrodes are pivotally attached to the headband. Lead wires from the output of a pulse generator connect with the electrodes. The lead wires to the input electrodes are run along the surface of the headband and covered with an insulating material.

3,659,615

ENCAPSULATED NON-PERMEABLE PIEZOELECTRIC POWERED PACESETTER

Carl C. Enger, 12700 Lake Avenue, Lakewood, Ohio

Filed June 8, 1970, Ser. No. 44,406
Int. Cl. A61n *1/36*
U.S. Cl. 128—419 P **5 Claims**



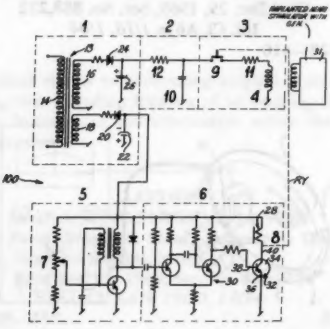
An encapsulated non-permeable piezoelectric self-powered pacesetter for implantation in an in vivo, or living, system in which the pacesetter is sealed and enclosed in an envelope formed of medical grade silicone rubber and preferably natural or synthetic animal, plant or insect wax, in which a piezoelectric polyncrystalline ceramic is completely embedded, enclosed or housed to function as a mechanical to electrical energy converter, when implanted near moving muscle in a living system, and without connection with a separate source of electrical energy either within or without the living system.

3,659,616

METHOD OF SYNCHRONIZATION AND STIMULATION BY MEANS OF PULSE PAIRS AT IMPLANTED HEART STIMULATORS WITH CONSTANT RHYTHM AND THE CIRCUIT FOR IMPLEMENTATION OF THIS METHOD

Bohdan A. Bukowiecki, ul. L. Staffa 12/14 M 23, and Mariusz Stopczyk, ul. J. Dabrowskiegv 86 m 71, both of Warsaw, Poland

Filed Aug. 28, 1969, Ser. No. 853,883
Claims priority, application Poland, Aug. 31, 1968, 128848
Int. Cl. A61n *1/36*
U.S. Cl. 128—419 P **8 Claims**



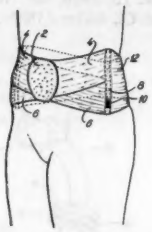
An external rhythm frequency generator is magnetically coupled to a constant rhythm frequency generator of an implanted heart stimulator through an induction coil to provide either externally synchronized pulse pair stimulation or acceleration of the stimulator dependent on the frequency of a signal from the external generator. A relay is provided to control the flow of energy through the coil. A capacitive charging network is provided which discharges through the coil to create an electromagnetic field when the relay is operated. The relay is operated by a triggering circuit, which, in turn, operates the relay in synchronization with the emission of the signal from the external generator.

3,659,617

CORSELET BELTS

Johannes Renbo, Havnen, Bogense, Denmark

Filed June 19, 1969, Ser. No. 834,773
Claims priority, application Denmark, June 21, 1968, 2950
Int. Cl. A41c *1/00*
U.S. Cl. 128—546 **5 Claims**



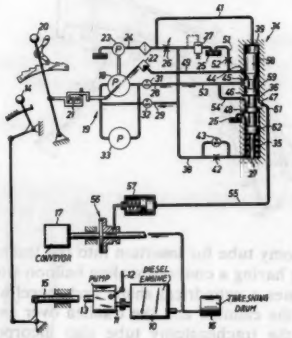
A stomach flattening abdominal belt for ladies comprising a vertical steel in either side, interconnected by a resilient rear belt piece having an upwardly curved lower edge and a resilient front piece constituted by two intercrossing resilient bands to the middle portions of which there is fastened a substantially non-stretchable circular or elliptic fabric pie piece.

3,659,618

CONTROL SYSTEM FOR LIMITING THE LOADING OF BRANCHED DRIVES

Walter Kobald, Stuttgart-Feuerbach, and Paul Bosch, Ludwigsburg, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

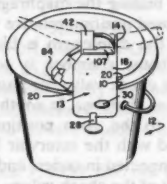
Filed Oct. 29, 1969, Ser. No. 872,280
Claims priority, application Germany, Nov. 2, 1968, P 18 06 677.8
Int. Cl. A01f *12/28*
U.S. Cl. 130—27 R **15 Claims**



A control system for the main drive and auxiliary drives of a combine in which the main drive propels the vehicle, and the auxiliary drive operates a threshing drum and its con-

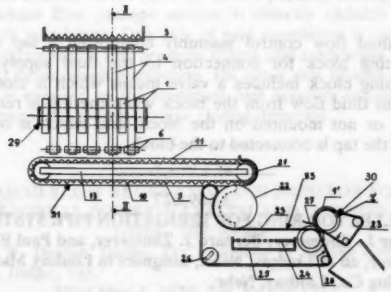
veyor. An engine drives the threshing drum directly, and the conveyor through a coupling, and also drives the pump of a hydrostatic transmission whose hydraulic motor propels the vehicle. A transducer pump, driven from the engine, and a throttle provide hydraulic signals controlling a valve to effect regulation of the transmission pump of the main drive, and to disengage the coupling to reduce the load on the engine. Setting means are provided for limiting the drive torque of the engine to a selected desired value, causing speed reduction and actuation of the control valve.

3,659,619
GREEN PEA SHELLER
Charles L. Westbrook, 715 Washington Avenue, Ayden, N.C.
Continuation-in-part of application Ser. No. 836,759, June 26, 1969, now abandoned. This application Jan. 28, 1971, Ser. No. 110,737
Int. Cl. A01d
U.S. Cl. 130—30 R **10 Claims**



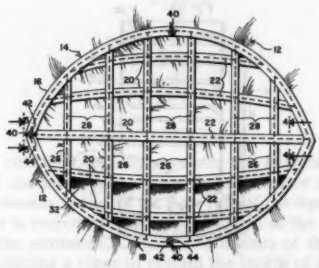
A pair of opposing pea pod aligning members supported for relative movement toward and away from each other and biased toward minimum spaced positions. One of the aligning members includes an adjustably retained cutter blade projecting outwardly therefrom toward the opposing member for slitting a pea pod advanced longitudinally between the members, and a curved tapered tongue is supported in position for spreading the split pod and raking the peas from within the pod.

3,659,620
PROCESS AND DEVICE FOR CUTTING TOBACCO LEAVES
Andre Pietrucci, and Pierre Imbert, both of Fleury-Les-Aubrais, France, assignors to Service D'Exploitation Industrielle Des Tabacs Et Des Allumettes, Paris, France
Filed Dec. 31, 1969, Ser. No. 889,668
Claims priority, application France, Dec. 31, 1968, 182372
Int. Cl. A24b *03/16, 07/06, 07/12*
U.S. Cl. 131—146 **9 Claims**



In a process for obtaining from tobacco leaves fragments of substantially constant shape and more particularly the shape of a quadrilateral having parallel opposite sides, wherein the leaves are subjected to a cutting operation along parallel and equidistant cutting lines, the fragments obtained are subjected to an orientation operation so that the cutting lines should assume a first given direction and the fragments which are thus oriented are caused to undergo a recutting operation along equidistant recutting lines which are parallel to a second given direction, the step of separating from all the oriented fragments which are caused to undergo the recutting operation all those fragments whose projection on a line at right angles to said second direction is smaller in length than the distance between said recutting lines.

3,659,621
AIR-FLO HAIR TEMPLET
Joseph Tucciarone, 382 West Street, Harrison, N.Y., and Martin Genuth, 119 Irma Drive, Oceanside, N.Y.
Filed June 18, 1970, Ser. No. 47,212
Int. Cl. A41g *15/00*
U.S. Cl. 132—53 **4 Claims**



A hair templet is constructed of a plurality of wefts of hair strands sewn to a base. The base is releasably anchored to the wearer's scalp by a plurality of snap fasteners. The sockets of the snap fasteners are secured in place to the user's natural hair. The base includes an oval band of fabric. A first plurality of parallel straps of fabric extend between discrete areas of the band and a second plurality of parallel straps perpendicularly intersecting the first straps extend between further discrete areas of the band. A portion of the base includes a layer of netting encompassing the area of the wearer's part. The wefts are sewn to the netting to prevent detection of the hair piece at the part line.

3,659,622
ORNAMENTAL HEADDRESS
Harry O. Meerson, 11 route de la Celle Saint-Cloud, Bougival (Yvelines), France
Continuation-in-part of application Ser. No. 801,967, Feb. 25, 1969, now abandoned. This application Nov. 12, 1970, Ser. No. 88,697
Int. Cl. A41g *3/00*
U.S. Cl. 132—53 **6 Claims**

An ornamental headdress comprises a framework in the form of a fitted skull cap and at least one fringe including a

plurality of thread-like or filamentary elements secured to the framework. The free ends of the filamentary elements are gathered to at least one region and secured one another to form a solid mass secured in turn to said framework. Ornaments may be provided with elements for securing the same to the gathered portion of the filamentary elements. The ornaments may carry hooking elements engageable with hooking elements on a fastener on the headdress, so that the ornaments may be readily interchanged.

3,659,623

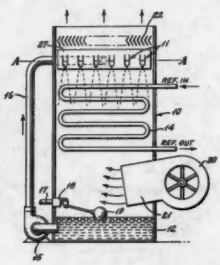
WATER SUPPLY SYSTEM

Thomas F. Facius, Baltimore, Md., assignor to Baltimore Aircoil Company, Inc., Baltimore, Md.

Continuation of application Ser. No. 425,783, Jan. 15, 1965, now abandoned. This application Dec. 2, 1969, Ser. No. 881,619

Int. Cl. F16k *51/00*

U.S. Cl. 137—255 **4 Claims**



This invention relates to evaporative heat exchangers and in particular to improved apparatus for the distribution of water over a heat exchange surface.

3,659,624

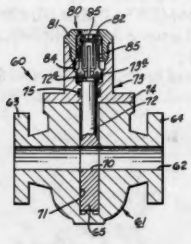
FIRE SAFETY VALVE

Warner M. Kelly, Houston, and John V. Fredd, Dallas, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Apr. 6, 1970, Ser. No. 25,976

Int. Cl. F16k *17/38*

U.S. Cl. 137—75 **2 Claims**



A heat responsive safety valve having a fusible material holding the valve at an open position. In one form the fusible material mechanically locks the valve open. In another form, the fusible material holds fluid pressure within a closed cylinder biasing a valve to its open position. In each form of the valve, the fusible material melts or otherwise weakens at a predetermined temperature releasing the valve to close shutting off flow through the conductor controlled by the valve as a fire-preventing measure.

3,659,625

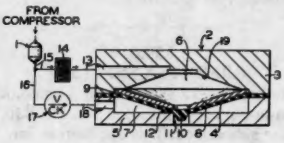
DRAIN VALVE DEVICE

Ronald W. Coiner, Irwin, and Norman Vutz, Verona, both of Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Feb. 16, 1970, Ser. No. 11,728

Int. Cl. F16t *1/14*

U.S. Cl. 137—204 **1 Claim**



A drain valve in which a diaphragm separates a supply chamber from an exhaust chamber, both chambers being connected in common with a reservoir, and including a Belleville spring normally biasing the diaphragm in a preselected one of an open or closed position relative to an exhaust port. In one embodiment the diaphragm is biased to the closed position and the exhaust chamber is connected with the reservoir by way of a check valve for passing fluid from the reservoir to the exhaust chamber. In another embodiment the diaphragm is biased to the open position and the exhaust chamber is connected with the reservoir by way of a choke and a check valve connected in series, and a reservoir is connected with the outlet of the check valve.

3,659,626

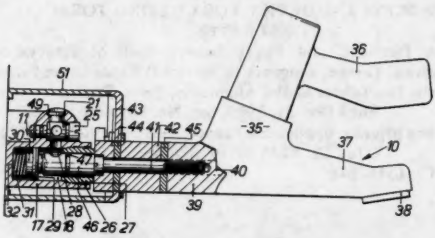
FLUID CONTROL ASSEMBLIES

Dennis Charles Arbon, Cheltenham, England, assignor to Walker, Crosweller & Company Limited, Cheltenham, England

Filed July 13, 1970, Ser. No. 54,341

Int. Cl. F16k *19/00*

U.S. Cl. 137—329.1 **7 Claims**



A fluid flow control assembly comprising a tap and a mounting block for connection to the fluid supply. The mounting block includes a valve means which is closed to prevent fluid flow from the block when the tap is removed from, or not mounted on the block, and which is opened when the tap is connected to the block.

3,659,627

COLLECTOR RING FOR IRRIGATION PIPE SYSTEMS

Arthur L. Zimmerer; Bernard J. Zimmerer, and Paul B. Zimmerer, all of Lindsay, Nebr., assignors to Lindsay Manufacturing Co., Lindsay, Nebr.

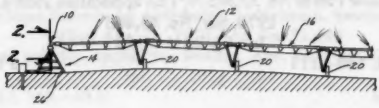
Filed Dec. 21, 1970, Ser. No. 100,157

Int. Cl. B05b *9/02*; E01h *3/02*

U.S. Cl. 137—344 **10 Claims**

A collector ring assembly for irrigation pipe systems which permits electrical power to be supplied from the center pivot

assembly to the electrical motors on the self-propelled towers which support the pipe and propel the pipe around the pivot assembly in a predetermined path. The collector ring assembly comprises a plurality of horizontally disposed, vertically spaced electrical contacts which are fixed against rotation and which are electrically connected to a source of elec-



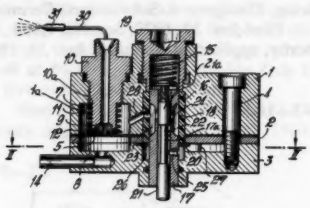
trical energy. A brush or wiper assembly is rotatably mounted with respect to the electrical contacts and wipe upon the contacts as the irrigation pipe is moved around the center pivot assembly. The brushes are electrically connected to the electrical motors on the towers to provide electrical energy thereto.

3,659,628

DISTRIBUTOR FOR CONTINUOUSLY OPERATING FUEL INJECTION SYSTEMS

Walter Bosch, Rommelshausen; Reinhard Schwartz, Stuttgart-Sillenbuch, and Gerhard Stumpp, Stuttgart, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 1, 1969, Ser. No. 862,875
Claims priority, application Germany, Oct. 15, 1968, P 18 03 066.5
Int. Cl. F16k *21/00*
U.S. Cl. 137—501 **8 Claims**



In a fuel distributor - in which the fuel to be delivered to a cylinder of an internal combustion engine is dosed by a metering valve - in order to maintain at a constant value the difference between the fuel pressure upstream of and downstream of the metering valve, there is provided a plurality of control valves (one for each cylinder) having a flat seat whose flow passage section is directly variable by a movable membrane. One side of said membrane is exposed to the downstream fuel pressure urging said membrane into a control valve opening direction, the other side of said membrane is exposed to the upstream fuel pressure urging said membrane into a control valve closing direction.

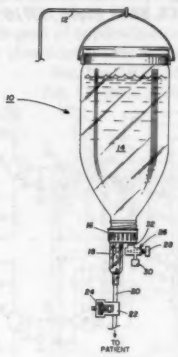
3,659,629

LIQUID FLOW REGULATOR AND MONITOR FOR CORPOREAL INFUSION SYSTEM AND METHOD OF USING THE SAME

David W. Deaton, Dallas, Tex., assignor to Ahlden Corporation, Dallas, Tex.

Filed May 4, 1970, Ser. No. 34,121
Int. Cl. F16k *37/00*
U.S. Cl. 137—551 **12 Claims**

The specification is directed to a device for regulating and visually indicating the rate of fluid flow from a corporeal infusion system such as an intravenous infusion system. One embodiment of the disclosed invention includes the detection of the rate of flow of air into the container of sterile liquid to be infused into the patient. The flow rate of the liquid to the patient is then visually indicated in response to the detected rate of flow of air into the container. In another embodiment of the invention, a housing is attachable to the air inlet of a conventional corporeal infusion system and includes a valve therein for regulation of the flow of air into the liquid container of the infusion system. Regulation of the amount of air



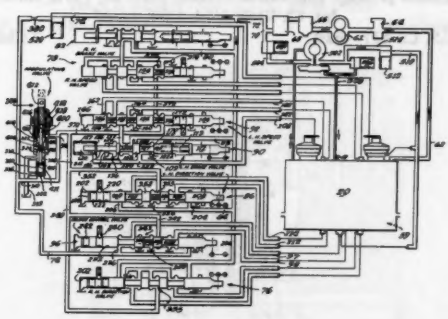
into the container directly regulates the flow rate of liquid from the container to the patient. An indicator scale on the housing visually indicates the flow rate of the liquid from the container in response to the measurement of the flow rate of air into the container. Other embodiments of the invention include utilizing a timer to control the length of infusion and utilizing an alarm system in order to maintain the liquid infusion to the patient at a predetermined level.

3,659,630

TRANSMISSION CONTROL SYSTEM

Robert G. Honeyager, Oak Creek, and James C. Rigney, Racine, both of Wis., assignors to J. I. Case Company

Original application June 30, 1969, Ser. No. 837,547, now Patent No. 3,608,397. Divided and this application July 20, 1970, Ser. No. 63,969
Int. Cl. F16k *11/10*
U.S. Cl. 137—596 **19 Claims**



A hydraulic control system for controlling actuation of a plurality of fluid operated friction devices forming part of a transmission for a vehicle with the system including speed and direction valves and a range valve engaged at all speeds. The system further includes a modulator valve which reduces the pressure of fluid supplied to the range valve to selectively control engagement of fluid couplings associated therewith. The modulating valve is designed for automatic operation

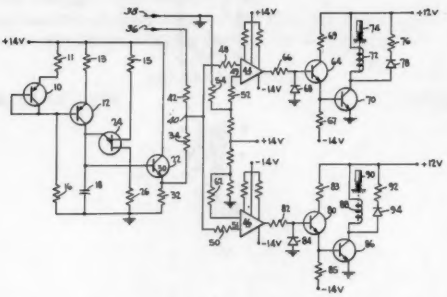
during normal shifting of the speed and direction valves between neutral and engaged positions and alternatively manually operable at the discretion of the operator.

3,659,631

CONTROLLER FOR A PULSED SERVOVALVE

John Peter Rakoske, Dover, N.H., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

Filed Aug. 5, 1970, Ser. No. 61,386
Int. Cl. F16k *31/06, 11/10*
U.S. Cl. 137—596.17 **7 Claims**



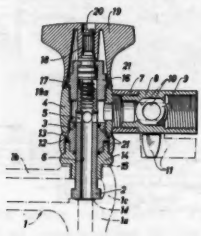
An exhaust and pressure solenoid is operated by a circuit which generates a repetitive sawtooth signal waveform upon which is superimposed an input representing a desired control signal for regulating the flow of an operating fluid to a device such as a tension controller or brake. The orifices of the exhaust and pressure solenoids are duty cycle modulated at the repetitive frequency of the sawtooth signal and their respective orifice sizes are varied in accordance with the input signal.

3,659,632

FAUCET CONTROL HAVING AN AUXILIARY OUTLET

Bengt Harald Jonsson, Schlosslihalde 33, CH-6000 Luzern, Switzerland

Filed Mar. 20, 1970, Ser. No. 21,299
Claims priority, application Sweden, Mar. 20, 1970, 3880/69
Int. Cl. F16k *1/04, 5/06, 11/10*
U.S. Cl. 137—610 **2 Claims**



A faucet control mountable on a faucet duct housing, capable of controlling the flow through said duct and also providing an auxiliary outlet from said control even when said faucet duct is closed by said control.

3,659,633

METHOD OF MAKING PARALLEL WIRE STRAND

Jackson L. Durkee, Bethlehem; Arthur F. Beighley, Williamsport, both of Pa., and Donald E. Dunlap, deceased, late of Montoursville, Pa. (by Mary E. Dunlap, administratrix), assignors to Bethlehem Steel Corporation

Division of application Ser. No. 575,038, Aug. 25, 1966, now Patent No. 3,526,570. This application June 4, 1970, Ser. No. 43,463
Int. Cl. B21f *15/06*
U.S. Cl. 140—111 **5 Claims**

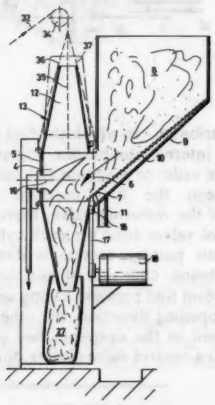
A stabilized parallel wire strand is made by drawing a plurality of wires through a forming die from a plurality of rotatable pay-offs each of which is arranged to rotate in a direction opposite to at least one other pay-off while clamping the wires at their leading ends to prevent rotation of the wires about their axes and finally binding the wires together with a resilient binding at intervals along the length of the strand. After binding the strand can be immediately reeled by actively or passively rotating the strand periodically about its longitudinal axis in alternate clockwise and counterclockwise directions as it passes onto a reel.

3,659,634

DEVICE FOR FILLING INDIVIDUAL RECEPTACLES WITH A METERED QUANTITY OF A FLOWABLE MATERIAL

Lothar Ohring, Pfarrgasse 6, Schweinfurt, Germany

Filed Jan. 30, 1970, Ser. No. 7,158
Claims priority, application Germany, Jan. 30, 1969, P 19 04 514.8
Int. Cl. B65b *43/50*
U.S. Cl. 141—163 **12 Claims**



A device for filling individual receptacles with a metered quantity of a flowable material which may be of viscous or granular consistency from a supply of such material comprises a metering wheel including a rotatable hollow hub on which are radially mounted a plurality of metering containers, open at both ends. The containers are successively filled with the material by feeding the material into the hollow hub from which it passes by gravity into the containers as the wheel turns. Each filled container discharges its contents

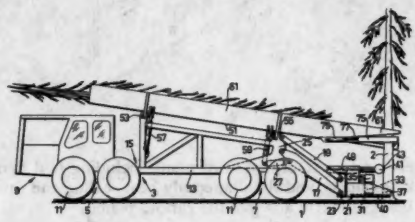
into a bag or other receptacle fitted upon the open outer end of the container. The thus filled bags are successively removed from the wheel for transfer to a point of utilization.

3,659,635

APPARATUS FOR FELLING AND BUNDLING TREES

Per Gustaf Mellgren, Soderhamn, Sweden, assignor to Kockum Soderhamn Aktiebolag, Soderhamn, Sweden

Filed Apr. 24, 1970, Ser. No. 31,493
Claims priority, application Sweden, Apr. 24, 1969, 5843/69
Int. Cl. A01g *23/02*
U.S. Cl. 143—43 N 8 Claims



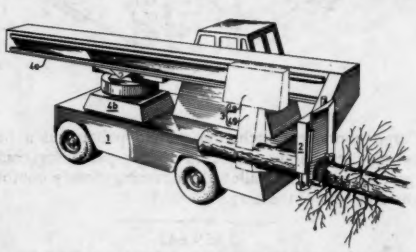
A feller buncher apparatus including in combination a cutter device, an elongated collected trough for severed trees, means to support the weight of a tree, and means to apply a force against the lower end of a severed tree so that it will topple into said elongated collecting trough.

3,659,636

METHOD AND APPARATUS FOR GRIPPING AND DEBRANCHING FELLED TREES

Erik Helmer Erikksson, Soderhamn; Olof Edvin Frisk, Ornskoldsvik; Lars-Gunnar Hogberg, Ornskoldsvik; Stig-Gunnar Lofgren, Ornskoldsvik, and Sven Paul Jarnstrom, Jarved, all of Sweden, assignors to Mo Och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Filed Oct. 8, 1969, Ser. No. 864,712
Claims priority, application Sweden, Oct. 11, 1968, 13777/68
Int. Cl. A01g *23/02*
U.S. Cl. 144—2 Z 15 Claims



A method is provided for gripping and debranching felled trees, in which the tree is gripped by a gripping member and lifted thereby from the surface of the ground to a higher plane, in which it is moved in its longitudinal direction through or beyond a debranching means, the gripping member and the debranching member being brought simultaneously into contact with the felled tree in the plane of the ground, and the branches and knots of the tree are then severed from the tree trunk by the debranching member.

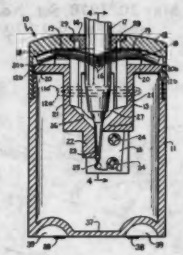
An apparatus is provided including a frame structure for horizontal and vertical movement on a support structure, a feed means capable of being moved along the frame and a gripping member and a debranching member which are securely attached to the frame. The debranching member comprises an upper and a lower tool, which are separated from each other, and comprise an elongated chain of members provided with cutting edges, and are pivotally connected to each other and with respect to the longitudinal extension of the tool. The members are rotatable in relation to each other between a position in which the tool is substantially straight and a second position in which the tool is curved at a certain radius, and form a continuous edge facing the conveying direction, irrespective of their mutual position.

3,659,637

PENCIL LEAD POINTER

Robert S. Condon, 112 Cindy Lane, Berlin, Conn.

Continuation-in-part of application Ser. No. 806,512, Mar. 12, 1969, now abandoned. This application Jan. 11, 1971, Ser. No. 105,155
Int. Cl. B43l *23/08*
U.S. Cl. 145—3.31 2 Claims



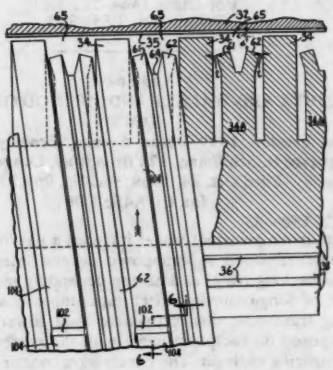
A pocket size lead pointer has a hollow housing bottom and a telescoping cap having a central pencil entering hole in its top. Finger tip depressions at either end of the housing bottom are offset laterally from the pencil hole so that the pointer may be rotated about a finger tip as pivot by manually moving the pencil in a circular path. A pencil guide bushing in the top hole secures a blade and its support to the cap interiorly of the housing. A lead guide passage axially aligned with the entrance and contiguous to the blade is spaced from the pencil guide more than half the heighth of the housing.

3,659,638

HEAVY DUTY MACHINE FOR PRODUCTION OF COMMINUTED MEAT AND OTHER FOODS

Stephen A. Paoli, 520 Sixth Street, Rockford, Ill.

Continuation-in-part of application Ser. No. 859,717, Sept. 22, 1969, now abandoned. This application Mar. 24, 1970, Ser. No. 22,151
Int. Cl. A22c *17/00, 25/16*; B02c *18/00*
U.S. Cl. 146—76 R 15 Claims



An improved separator machine for producing boneless comminuted meat and other smooth comminuted food

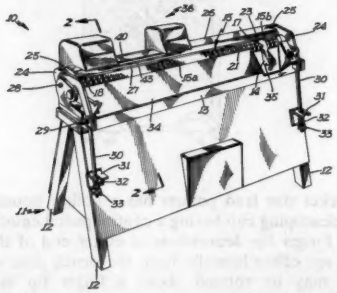
products from a coarse agglomeration of fragmented hard and soft tissues which are separated automatically and continuously and discharged separately. The machine incorporates an improved mechanical separator utilizing a revolvable separator member reinforced structurally by cutting elements. The latter may also have external teeth. The machine is adapted to process raw material in a frozen, partially frozen or unfrozen state and is particularly suitable for processing red meat as well as poultry and fish.

3,659,639

SKINNING MACHINE HAVING A RECIPROCATING FAT REMOVING KNIFE MECHANISM THEREOF

Oscar H. Lindstrom, and Nathan A. Fischer, both of Austin, Minn., assignors to Geo. A. Hormel & Co., Austin, Minn.

Filed May 20, 1970, Ser. No. 39,110
Int. Cl. A22c *17/12*
U.S. Cl. 146—130 **3 Claims**



A skinning machine for removing skin from hams includes a frame having a driven roll mounted thereon, the roll including a plurality of axially spaced apart serrated blades thereon which revolve in close proximity to a pressure shoe. The pressure shoe has an elongate skinning blade fixedly mounted thereon which is positioned closely adjacent the driven roll. An elongate fat removing blade is mounted closely adjacent the pressure shoe and is longitudinally reciprocable relative to the pressure shoe and is operable during its reciprocating movement to facilitate removal of excess fat from the ham prior to the skin removing operation.

ERRATUM

For Class 146—222 see:
Patent No. 3,659,315

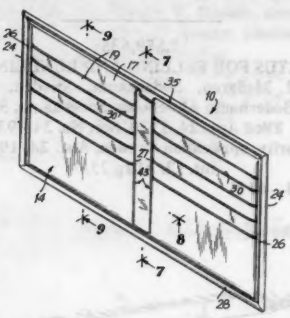
3,659,640

CREDIT CARD WALLET AND METHOD OF MAKING SAME

Nathan Fenster, 1709 Ocean Avenue, Brooklyn, N.Y., and Theodore H. Schiffman, 124 Broadway, Lawrence, N.Y.

Filed Oct. 24, 1969, Ser. No. 869,139
Int. Cl. A45c *1/00*
U.S. Cl. 150—35 **9 Claims**

A multicompartment wallet includes a pair of transversely spaced first panels superimposed on and integrally formed with a backing panel and having depending medial tongues. A set of longitudinally offset superimposed second panels having transverse slits, proximate their lower edges is superimposed on each first panel with the corresponding tongue engaging each slit. The panels have overlapping side tabs heat-sealed to each other. A rear panel underlies the backing panel and is provided with integrally formed front panels overlying the lowermost of the second panels, and side flaps overlying and heat-sealed to the outer side edges of the first, second and front panels. The wallet is produced by jig-positioning a first blank including the front and rear panels, a plurality of preformed scond blanks including the second



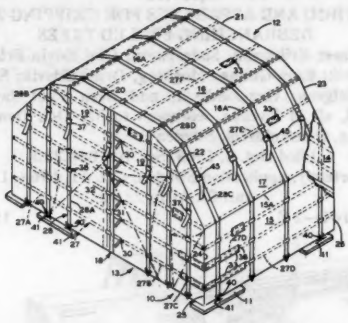
panels, and a preformed third blank including said first and backing panels, and simultaneously heat-sealing and severing the blanks to form and join the various panels.

3,659,641

CARGO CONTAINER

Frank J. Marino, 8802 Foster Avenue, Brooklyn, N.Y.

Filed Oct. 3, 1969, Ser. No. 863,500
Int. Cl. B65b *65/02*
U.S. Cl. 150—52 **6 Claims**



Cargo containers including a rigid pallet and a flexible covering detachably connected to the pallet for enclosing cargo carried by the pallet; the covering closely conforming to the contours of the cargo.

3,659,642

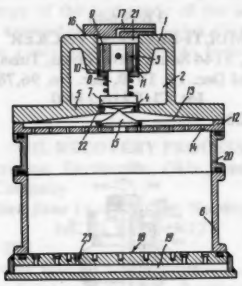
APPARATUS FOR COMPACTING A MOULDING MIXTURE

Lev Fedorovich Vasilkovsky, Donetskoi oblasti, ulitsa Koroleva, 25, kv. 52, Slavyansk; Vladimir Efimovich Sjusjuk, ulitsa Shkadinova, 29, kv. 23, Kramatorsk; Nikolai Nikitovich Abrosimov, ulitsa Voznesenskogo, 19, kv. 60, Kramatorsk; Georgy Andreevich Geldebrekhov, ulitsa Sotsialisticheskaya, 72, kv. 9, Kramatorsk; Vsevolod Andreevich Lyashenko, ulitsa Bogdana Khmelnitskogo, 16, kv. 9, Kramatorsk, and Vladimir Ivanovich Podmogilny, poselok Krasnogorka, ulitsa Deputatskaya, 120, Kramatorsk, all of U.S.S.R.

Filed Dec. 22, 1969, Ser. No. 887,223
Int. Cl. B22c *15/00*
U.S. Cl. 164—169 **4 Claims**

A device for compacting a moulding mixture in which the latter is subjected to the action of compressed air by supplying the air into a reservoir under a pressure exceeding 20 kg/cm² in such an amount that 3 to 40 volumes of air under a

normal pressure are provided per unit or volume of the mixture being densified. Then the reservoir is discharged during a time interval not exceeding 0.15 sec. by directing the flow of air into the mixture in a moulding box. The reservoir is



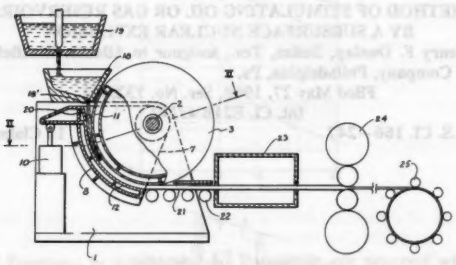
formed by a chamber of a housing and at the external side of this housing under a discharge opening closed by a valve there is mounted a plate forming an additional chamber. The plate has holes for a uniform distribution of the air over the surface of the mixture being compacted.

3,659,643

APPARATUS FOR THE CONTINUOUS CASTING OF METAL STRIP

Heinrich Pauels, Duesseldorf-Lohausen, Germany, assignor to Schloemann Aktiengesellschaft, Dusseldorf, Germany

Filed Aug. 5, 1970, Ser. No. 61,118
Claims priority, application Germany, Aug. 16, 1969, P 19 41 729.9
Int. Cl. B22d 27/08
U.S. Cl. 164—260 **5 Claims**



In an apparatus for the continuous casting of metal strip a casting cavity is formed between a rotating casting drum and an oscillating casting shoe, both of which are supported on a common shaft.

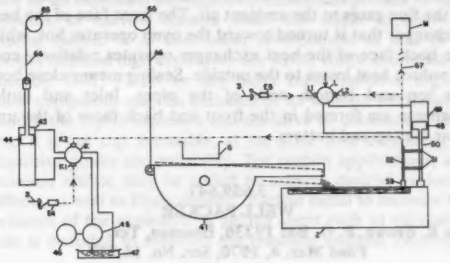
3,659,644

APPARATUS FOR THE CASTING OF METAL ANODES

Edouard De Bie, Antwerp, Belgium, assignor to Metallurgie Hoboken, Brussels, Belgium

Filed May 5, 1969, Ser. No. 821,866
Claims priority, application Belgium, May 15, 1968, 58412
Int. Cl. B22d 5/02
U.S. Cl. 164—326 **5 Claims**

An apparatus and process for casting of metal, such as copper anodes. The apparatus includes an oven for melting the metal and a rotatable casting wheel which carries a series of molds. A tiltable ladle pours the molten metal into a mold, and sensing means inside the mold produces a signal in response to the level of the molten metal in the mold for ending the pouring operation from the ladle. When the pouring



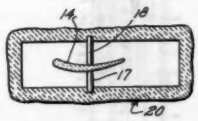
operation for a particular mold has terminated, the casting wheel is automatically rotated to bring the next mold into proper position for receiving the molten metal.

3,659,645

MEANS FOR SUPPORTING CORE IN OPEN ENDED SHELL MOLD

John A. Rose, Cleveland Heights, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Aug. 9, 1965, Ser. No. 478,080
Int. Cl. B22c 9/10
U.S. Cl. 164—353 **6 Claims**



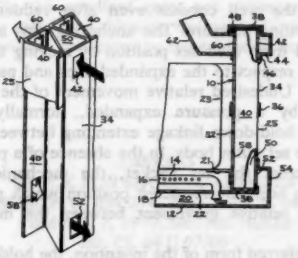
An open ended refractory shell mold having a casting cavity therein, a chill block positioned to close off the open end of said mold and a ceramic core having one end received within said mold and having a free end extending into said molding cavity. The free end of said core is restrained from lateral movement within said molding cavity by engaged pin means having opposed ends anchored in the mold walls.

3,659,646

HEAT EXCHANGER CONSTRUCTION

Bohdan Hurko, and Raymond L. Dills, both of Louisville, Ky., assignors to General Electric Company

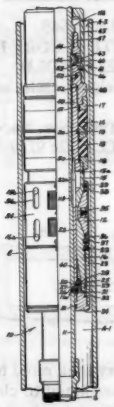
Filed June 15, 1970, Ser. No. 46,114
Int. Cl. F28d 9/00
U.S. Cl. 165—164 **9 Claims**



A heat exchanger for use in the flue gas exhaust system of a self-cleaning gas cooking oven in the form of a large

square-cornered corrugated panel that is collapsed from the sides in the plane of the panel to create two intermeshed series of triangular shaped pipes where one series of alternate pipes carry hot flue gases while the opposite series of alternate pipes carry inlet air for transferring some of the heat of the flue gases to the ambient air. The front face of the heat exchanger that is turned toward the oven operates hot, while the back face of the heat exchanger operates relatively cool to reduce heat losses to the outside. Sealing means close both the top and bottom ends of the pipes. Inlet and outlet openings are formed in the front and back faces of the unit near the top and bottom.

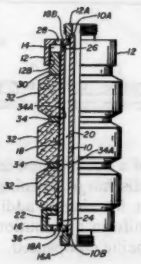
3,659,647
WELL PACKER
Joe R. Brown, P. O. Box 19236, Houston, Tex.
Filed Mar. 4, 1970, Ser. No. 16,327
Int. Cl. E21b *23/06, 33/129*
U.S. Cl. 166—120 **12 Claims**



A single piece, tubular mandrel extends centrally through a closely surrounding composite outer body. The outer body includes metal anchoring slips and resilient packers to respectively anchor the outer body and supporting central mandrel to a surrounding well pipe and to seal the annular space formed between the mandrel and the surrounding well pipe. The outer body includes setting components which are moved axially by hydraulic setting pressure introduced through the mandrel into expandable chamber means formed in the outer body. The setting components wedge under the anchoring slips and axially foreshorten the packer, forcing the slips and packer radially outwardly into engagement with the surrounding well conduit. Reverse axial movement of the setting components is prevented by a one-way acting friction lock which retains the anchoring slips and packer in engagement with the well conduit even after reduction of the hydraulic setting pressure. The anchoring slips and packers are released from their set position by moving the mandrel axially with respect to the expanded slips and packer in the outer body. Undesired relative movement of the mandrel is prevented by a pressure expanded, normally retracted mechanical hold-down linkage extending between the mandrel and the set outer body. In the absence of a pressure differential across the set packer, the mechanical linkage returns to a normally retracted position which provides no obstacle to relative movement between the mandrel and outer body.

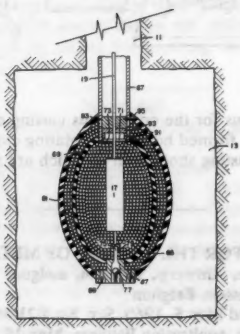
In the preferred form of the invention, the hold-down linkage includes a series of radially movable pistons acting against a resilient snap ring to retain the snap ring in engagement with a groove in the outer body. In a modified form, the hold-down linkage is an outwardly biased annular ring having internal grooves adapted to mate with external grooves formed on the mandrel. The ring is moved toward the mandrel by axially movable, tapered wedging means driven by hydraulic pressure.

3,659,648
MULTI-ELEMENT PACKER
James H. Cobbs, 5144 South New Haven, Tulsa, Okla.
Filed Dec. 10, 1970, Ser. No. 96,786
Int. Cl. E21b *23/00*
U.S. Cl. 166—120 **5 Claims**



A multi-element packer for closing a borehole including a tubular inner mandrel, a cylindrical member at one end of the mandrel and a coupling plate at the other end, an outer mandrel coaxially positioned over the inner mandrel providing an annular passageway between the two, an annular piston positioned in the cylinder member displaced by fluid pressure applied to the cylinder member, and a plurality of tubular elastomer elements positioned on the outer mandrel between the piston and the coupling plate, the elastomer elements being expanded by force of the piston.

3,659,649
METHOD OF STIMULATING OIL OR GAS RESERVOIRS BY A SUBSURFACE NUCLEAR EXPLOSION
Henry F. Dunlap, Dallas, Tex., assignor to Atlantic Richfield Company, Philadelphia, Pa.
Filed May 27, 1968, Ser. No. 732,401
Int. Cl. E21b *43/00*
U.S. Cl. 166—247 **12 Claims**



A nuclear explosive device for subsurface use is assembled and detonated through a small diameter borehole by enlarging a section of the borehole to a sufficient size, lowering a triggering device into the enlarged section and placing nuclear explosive fuel material around the trigger. The

nuclear fuel material is surrounded by a second material which may be of higher density and may also be a fuel material. Heavy water may be injected into or with the nuclear fuel material. The nuclear fuel material may contain the deuteride of an active metal substance and be slurried with an anhydrous liquid; or it may contain the heavy hydrogen isotope of the hydroxide of the active metal substance and be slurried with heavy water. Concentric collapsible, expansible containers are used to form the nuclear explosive.

3,659,650

OIL RECOVERY PROCESS

Charles A. Stratton, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed June 15, 1970, Ser. No. 46,552

Int. Cl. E21b *43/22*

U.S. Cl. 166—275 **8 Claims**

An oil recovery process which employs, as an additive to the aqueous material used for waterflooding, at least one of the reaction product of sulfamic acid and a polyethoxy alcohol or, the ammonium sulfate slat of a polyethoxylated alkylphenol is disclosed.

3,659,651

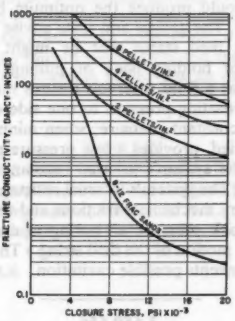
HYDRAULIC FRACTURING USING REINFORCED RESIN PELLETS

John W. Graham, Houston, Tex., assignor to Esso Production Research Company, Houston, Tex.

Filed Aug. 17, 1970, Ser. No. 64,339

Int. Cl. E21b *43/26*

U.S. Cl. 166—280 **12 Claims**



Fractures in a subterranean formation are propped with propping agent particles composed of a synthetic resin substantially inert to formation fluids and containing reinforcing materials dispersed therein.

3,659,652

LIQUID EXPLOSIVE FOR WELL FRACTURING

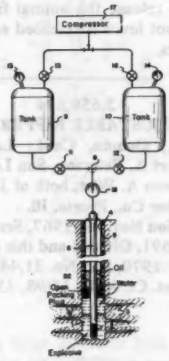
Leonard N. Roberts, Scottsdale, Ariz., assignor to Talley-Frac Corporation, Pryor, Okla.

Continuation of application Ser. No. 765,113, Oct. 4, 1968, now abandoned. This application Jan. 27, 1971, Ser. No. 110,315

Int. Cl. E21b *43/26*

U.S. Cl. 166—299 **10 Claims**

A cap insensitive liquid explosive is described which is particularly useful for fracturing a formation containing a network of narrow fissures adjacent a well bore in order to bring in a well or to increase its productivity, which includes a nitroparaffin compound, preferably nitromethane, capable of dissolving substantial amounts of high explosive compounds, and one or more of certain high explosive compounds dissolved therein. The high explosive compounds are of a kind and are present in an amount capable of rendering the liquid explosive sufficiently diameter insensitive to permit propagation of an explosion throughout a substantial portion of such network of narrow fissures when the liquid explosive is placed therein or in such other environment as it is to be used. Preferred high explosives are RDX, HMX and mixtures thereof. TNT, PETN or any other high explosive organic nitro compound may be included in an amount sufficient to render the liquid explosive less sensitive to detonation, such that it is not cap detonable, at the same time enhancing its explosive power and reliability. For certain applications, ammonium nitrate may be added to achieve desired explosive effects, as well as finely divided reactive metal to increase the brisance of the explosive. A gelling agent such as nitrocellulose is included to maintain the resulting uniform dispersion



for long periods of time. A method of pressure-transferring a liquid explosive into the well bore and pressuring it back into the productive formation is described in which the explosive is injected through a tube into the well bore directly adjacent the formation to be fractured, the tube having first been cleared of air, by placing the liquid explosive in one or more tanks connected to the injection tube at the well surface and which are subjected to air pressure to force the explosive into the well. Further, a well fracturing method which is self cleaning, rendering unnecessary the usual cleaning step which follows fracturing, is disclosed in which the well bore is restricted above the level of the explosion and is closed above the restriction with sand or the like such that sufficient back pressure is maintained in the well for satisfactory fracturing, while the resultant gases are subsequently vented through the restriction, blowing the sand or other ballast as well as the rubble generated by the explosion out of the well bore.

3,659,653

STOCK FOR SHOEING ANIMALS

Oliver L. Allsup, P. O. Box 274, High Rolls, N. Mex.

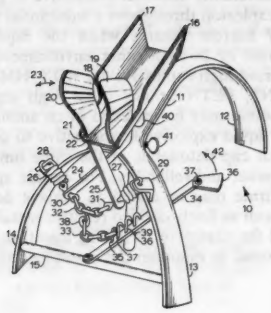
Filed Oct. 7, 1970, Ser. No. 78,823

Int. Cl. A01l *07/00*

U.S. Cl. 168—44 **14 Claims**

A stock for shoeing animals including on a tripod base a channel for receiving a leg of the animal, the channel having adjacent thereto means for adjustably constraining the hoof.

A foot lever is provided to control the constraining means against a normally applied bias away from the constraining



position to rapidly release the animal from the constraining means when the foot lever is released so as not to endanger the animal if it bolts.

3,659,654

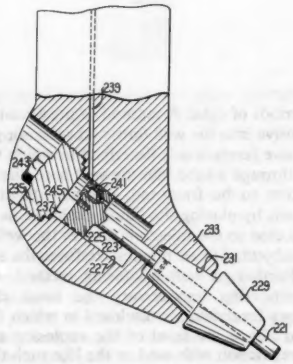
ADJUSTABLE RIPPER TIP

James M. Davies,, Orinda, Calif.; Larry G. Hackmann, Peoria, Ill.; Robert A. Peterson, San Leandro, Calif.; Roger M. Smith, and Leon A. Wirt, both of Joliet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Original application Nov. 29, 1967, Ser. No. 686,501, now Patent No. 3,550,691. Divided and this application Apr. 10, 1970, Ser. No. 31,449

Int. Cl. A01b *13/08, 35/20*

U.S. Cl. 172—699 **3 Claims**



A ripper in which the ground engaging tip can be advanced in its holder to accommodate for wear of the ripper tip. The tip may be advanced manually or hydraulically depending on the mechanism used and is held in place by friction and/or a pinning means.

3,659,655

FEED CONTROLLING METHOD AND SYSTEM

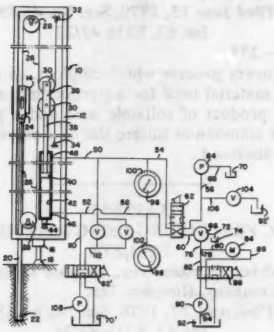
Laszlo Gyongyosi, Clarksburg, W. Va., assignor to Ingersoll-Rand Company, New York, N.Y.

Filed June 2, 1970, Ser. No. 42,627

Int. Cl. E21c *5/10*

U.S. Cl. 173—1 **14 Claims**

A drilling head and drill string is fed, or the feed is restrained, by a hydraulic-fluid-actuated piston. Hydraulic lines supplying and evacuating hydraulic fluid to and from the piston have gauges connected thereto to signal pressure conditions, in psi, at the piston. Scales calibrated in pounds are mounted adjacent to the gauges to signal, per machine and drill string and their characteristics, as well as the characteristics of the material being drilled, a proper correspondence between actual bit weight and an optimum feed pressure of fluid pressure assistance or restraint. A valve controls the hydraulic fluid supply and evacuation, selectively, to effect a holding back of the drill string, when its dead weight less the system's internal resistance would produce excessive bit weight, a pulling down of the drill string when its dead weight less the system's internal resistance would yield inadequate bit weight or pressure monitoring on a level just to



offset the system's internal resistance when the drill string weight alone would produce the optimum bit weight (i.e., zero hold-back). The gauges and scale advise the operator of the operational feed status that he might determine the requirements for holding back or pulling down the drill string. Valving at a fluid reservoir insures maintenance of a constant compensating pressure to one side of the piston at all times. This constant pressure, when minimum hold-back pressure is applied, provides a low pressure pull-down force to counteract the system's internal resistance so zero hold-back can exist. (The system's internal resistance is the sum of various stationary mechanical frictions and the minimum obtainable hold-back pressure all acting against the development of a down motion of the drill string.) The compensating pressure also prevents possible cavitation.

3,659,656

ARRANGEMENT FOR SLIDE-TRACKING OF A BORING MACHINE IN MINES WITH A LIMITED PROFILE

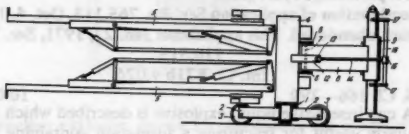
Vladimir Mares, Pribram, Czechoslovakia, assignor to Ceskoslovensky uranovy prumysl, oborovy podnik, Pribram, Czechoslovakia

Filed Nov. 16, 1970, Ser. No. 89,595

Claims priority, application Czechoslovakia, Nov. 18, 1969, 7601-69

Int. Cl. E21c *11/02*

U.S. Cl. 173—23 **4 Claims**



A truck adapted to move on tracks in mine galleries supporting at least one boring set is provided with a vertical

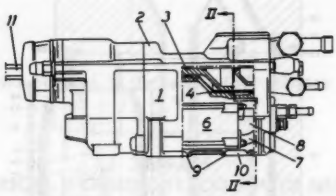
frame rotatably mounted on the truck frame around its vertical axis, which vertical frame supports on one side at least one boring set, on the other side a horizontal beam pivotably around a vertical axis, the other end of said beam fixed to the jacket of an extensible prop, with hydraulic cylinders controlling mutual position between the vertical frame and the horizontal beam, between the truck frame and the vertical frame and the position of the arms with wheels supporting the truck.

3,659,657

INDEPENDENTLY ROTATED PNEUMATIC ROCK DRILL

Erik Johan Victor Ahlberg; Gosta Bernard Ekwall, both of Nacka, and Rolf Arthur Ronald Lindqvist, Tumba, all of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Oct. 1, 1970, Ser. No. 77,233
Int. Cl. B25d *9/00*
U.S. Cl. 173—105 **4 Claims**



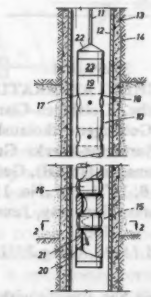
An independently rotated, muffled pneumatic rock drill comprising an impact mechanism housing in which an impact mechanism and a rotation motor are located and in which housing also is enclosed an air volume into which the exhaust air from both the impact mechanism and the rotation motor is discharged. The rotation motor has an exhaust pipe of a tuned length.

3,659,658

WELL PERFORATING APPARATUS

Emmet F. Brieger, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Sept. 28, 1970, Ser. No. 75,857
Int. Cl. E21b *43/117*
U.S. Cl. 175—4.6 **13 Claims**



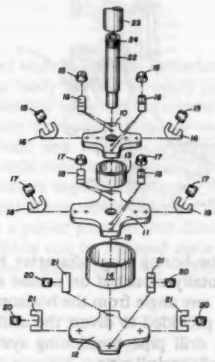
As an illustrative embodiment of the present invention, an elongated thick-wall tubular perforating carrier is provided with one or more pairs of aligned openings formed at spaced intervals along the opposed walls of the carrier. Typical shaped explosive charges are respectively enclosed within fluid-tight thick-wall containers which are complementally shaped for reception in the openings and adapted to be supported therein by the opposed carrier walls. A container is secured in each pair of the openings and a detonating cord is passed through the interior of the carrier and successively looped outwardly around the rear of each container within detonating proximity of each shaped charge. In this manner, the new and improved apparatus can be employed for perforating operations without leaving debris in the well bore or damaging the casing.

3,659,659

LARGE DIAMETER BIT WITH A REPLACEABLE STEM

Carl L. Lichte, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 4, 1970, Ser. No. 8,582
Int. Cl. E21c *23/00*
U.S. Cl. 175—53 **8 Claims**



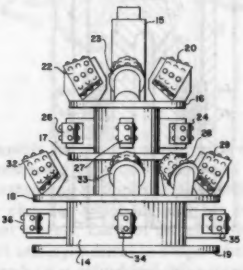
A bit for drilling a large diameter hole has a replaceable stem. The body of the bit includes a multiplicity of stages around a central axis. The bit is attached to the drill column by a replaceable stem connected to the main body of the bit and the body of the bit includes a series of plates separated by a series of hollow support elements.

3,659,660

LARGE DIAMETER BIT FOR SHALLOW ANGLE HOLES

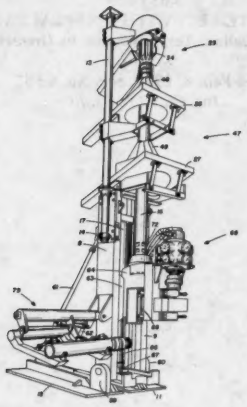
William M. Conn, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 10, 1970, Ser. No. 27,281
Int. Cl. E21c *23/00*; E21d *3/00*
U.S. Cl. 175—53 **6 Claims**



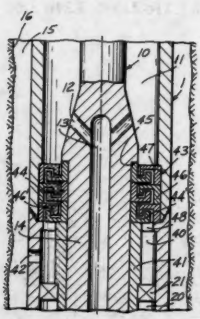
A bit for enlarging a pilot hole into a large diameter hole includes a plurality of drilling stages surrounding a central shaft. Integral stabilization sections are included after each drilling stage.

3,659,661
EARTH BORING MACHINE
James W. Young, Irving; George A. Cason, Dallas, both of Tex., and Ernest O. Kunkel, Nevada, Mo., assignors to Dresser Industries, Inc., Dallas, Tex.
Filed Feb. 2, 1970, Ser. No. 7,923
Int. Cl. E21b 7/00, 19/00
U.S. Cl. 175—85 3 Claims



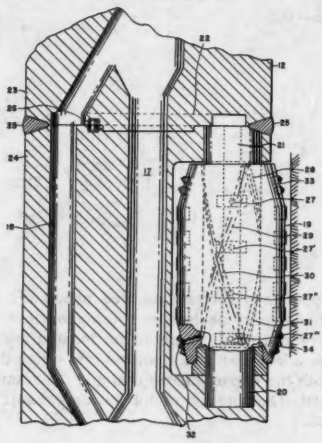
An apparatus for boring large diameter holes. A drilling mechanism is pivotally mounted on a base and arranged so that it may drill at any angle from the horizontal, either up or down. Means are provided to divert the drilling residue and loose rock and a drill pipe positioning system installs and removes sections of the drill pipe.

3,659,662
THRUST BEARINGS FOR UNDERGROUND DRILLING ENGINES
Leonide Dicky, Grenoble, France, assignor to Societe Generale de Constructions Electriques et Mecaniques (ALSTHOM), Grenoble, France
Filed Apr. 22, 1970, Ser. No. 30,803
Claims priority, application France, Apr. 25, 1969, 6911838
Int. Cl. E21b 3/12
U.S. Cl. 175—107 5 Claims



The oil bath layout for the lower thrust bearing in an underground drilling machine comprises an upper sealing joint below which means are provided for maintaining the oil pressure at a level which is at least equal to that of the surrounding pressure of the mud in the borehole. Such means may include a cylinder fitted with a piston and having one of its chambers in communication with the oil bath and the other of its chambers in communication with the borehole. An oil pressure control spring is located in the chamber in communication with the borehole and acts on the piston. The upper sealing joint forms the lower end of a second chamber in communication with the borehole and closed at its upper end by a leak limiting joint, such as one of the labyrinth type.

3,659,663
BOREHOLE REAMER-STABILIZER WITH IMPROVED FLUID CIRCULATION
Theodore R. Dysart, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed Dec. 28, 1970, Ser. No. 101,696
Int. Cl. E21b 9/08, 9/24; E21c 23/00
U.S. Cl. 175—325 11 Claims

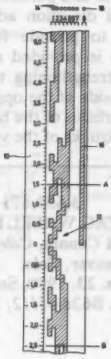


A plurality of passages transmit fluid end to end in the reamer-stabilizer body. Individual cutters are mounted on hollow shafts affixed to the reamer-stabilizer body. A circular passage transmits fluid to the center of the hollow shafts. Holes connect the outside of each shaft with the hollow central portion. Spiral grooves are located longitudinally on the inside diameter of the cutter.

3,659,664
WEIGHING APPARATUS
Erich Emil Karl Knothe, Gottingen-Gismar, and Eckhard Otto Walter Billin, Gottingen-Nikolausberg, both of Germany, assignors to Sartorius-Werke GmbH (und vormals Gottinger Prazisionswaagen GmbH), Gottingen, Germany
Filed June 8, 1971, Ser. No. 151,102
Claims priority, application Germany, June 16, 1970, P 20 29 735.2
Int. Cl. G06f 15/20; G01g 23/37, 23/42
U.S. Cl. 177—25 11 Claims

A weighing apparatus has a scale with code tracks which can be read by reading means. The scale is a tolerance scale and gives the possibility of achieving a predetermined or a selectable percentage accuracy of the tolerance part values which are covered by one code each. This is achieved by giving the codes in different ranges of the tolerance scale different lengths. The weighing apparatus may have several tolerance scales with different tolerance part values, the tolerance scales being centered at different weights, e.g., 5 or

10 or 20 g. In order to weigh a load with a certain desired percentage accuracy, the weighing apparatus is brought, f.i.



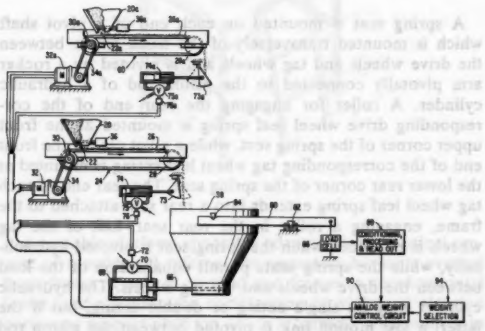
by an additional load, to the range of the selected tolerance scale.

3,659,665

ELECTRICAL WEIGHING SYSTEMS WITH MULTIPLE INCREMENTAL READOUTS

Gilbert Allan Godwin, Oakland, N.J., and Chapin A. Pratt, Rutland, Vt., assignors to Howe Richardson Scale Company

Filed July 27, 1970, Ser. No. 58,259
Int. Cl. G01g *3/14*
U.S. Cl. 177—1 **26 Claims**



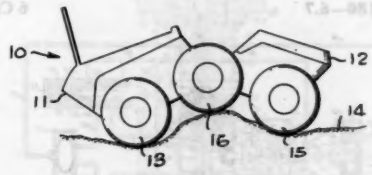
A weighing apparatus and method wherein an electrical analog signal, having a level representative of the weight of a load, is converted into a digital pulse train by an analog-to-digital converter. A counter for counting the converter-produced pulses is connected to one or more devices that provide a readout of the weight in visual and/or printed form. A program circuit is operatively connected to the converter and the counter, and selected circuit connections are made in the program for providing a selected one or more of the following conditions: (1) the division of the pulse train by a pre-selected divisor to count in only the quotient at the counter (2) the transfer of selected information from the counter to the readout devices to cause the weight to be read out by counting in any of a plurality of different increments such as ones, twos, or fives. Additional features pertain to tare circuits for taring the weight-representing signal.

3,659,666

ARTICULATED VEHICLE

John P. Forsyth, and Robert W. Forsyth, both of 1517 North 3rd Avenue, San Bernardino, Calif.

Filed Oct. 2, 1969, Ser. No. 870,438
Int. Cl. B62d *11/02*
U.S. Cl. 180—6.2 **7 Claims**



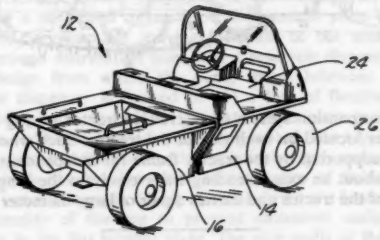
An articulated wheeled vehicle is disclosed herein having a front and a rear body portion pivotally joined together by a central axle rotatably mounted on opposing projections carried on the body portions. Axles are rotatably carried on each of the front and rear body portions so that a six-wheeled, three-axle vehicle is produced. Each axle comprises a pair of coextensive segments mounted in suitable bearings and each segment is separately powered via a drive train and transmission by a power plant so that directional control and speed of the vehicle can be attained since the axle segments may be rotated individually at different speeds and directions.

3,659,667

VEHICLE FRONT WHEEL DRIVE ASSEMBLY

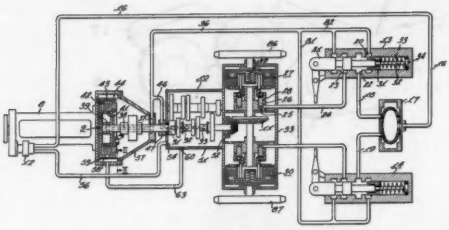
John A. Rogers, and Fredrick R. Bossard, both of Fort Dodge, Iowa, assignors to Standard Engineering Co., Inc., Fort Dodge, Iowa

Filed Dec. 19, 1969, Ser. No. 886,472
Int. Cl. B62d *11/08*
U.S. Cl. 180—6.2 **4 Claims**



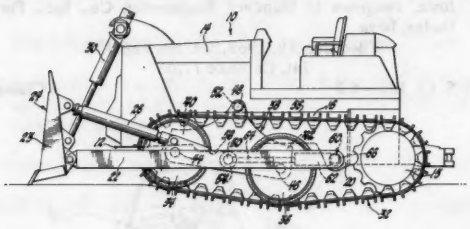
A drive assembly for a front wheel drive vehicle wherein a gear box is connected by a drive shaft and in turn provides driven shafts extending in opposite directions for connection with separate clutches which in turn are connected to the respective front wheels. Each of the clutches includes a pair of jaw portions semicylindrical in shape when in engagement with each other form a cylindrical drive member. Each of the jaw members are keyed to separate shafts for rotation therewith and an actuating lever is connected to a yoke in turn connected to one of the jaw members for sliding it along its shaft into and out of engagement with the other axially stationary jaw.

3,659,668
STEERING CLUTCH AND ENGINE CLUTCH HYDRAULIC CIRCUIT
Roy C. Ross, and Larry L. Bandy, both of Springfield, Ill., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.
Filed Nov. 9, 1970, Ser. No. 88,007
Int. Cl. B62d 11/08
U.S. Cl. 180—6.7 6 Claims



A hydraulic system in a crawler tractor having a single pump which supplies high pressure fluid for operating the steering clutches and low pressure fluid for lubricating the engine clutch and change-speed transmission. The engine clutch flywheel acts as an impositive displacement centrifugal pump for conveying fluid from the engine clutch housing to the low pressure side of the hydraulic system.

3,659,669
SUSPENSION SYSTEM FOR CRAWLER TRACTOR
Janis Mazzarins, Macedonia, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Oct. 16, 1970, Ser. No. 81,473
Int. Cl. B62d 55/14
U.S. Cl. 180—9.5 6 Claims

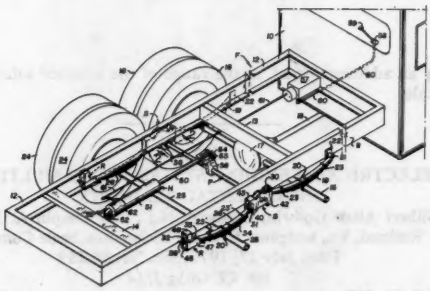


A suspension system for a crawler tractor having a wheel carrier located on each side of the tractor. Each wheel carrier is supported by the tractor frame for independent oscillation about an axis extending transversely to the longitudinal axis of the tractor and carries a pair of large diameter wheels.

3,659,670
EQUALIZER BAR FOR USE IN TRACKED VEHICLES
Clady J. Royer, P.O. Box 75181, Oklahoma City, Okla.
Filed Dec. 11, 1969, Ser. No. 884,192
Int. Cl. B62d 55/08
U.S. Cl. 180—9.5 2 Claims

An equalizer bar for supporting the body and engine structure of tracked vehicles on a pair of horizontally spaced, longitudinally extending trucks. The bar is an elongated element having a central web portion and a pair of flanges secured to the opposed longitudinal edges of the web portions to form an I-shaped cross-section for the equalizer bar over a major portion of its length. The flanges converge towards the ends of the bat and merge in end portions, and the web portion is flared in a horizontal direction adjacent the opposite end portions of the bar to provide further reinforcement. A strengthening column is provided at the central portion of the bar for further strengthening the bar. Wear plates are secured on the under side of the opposite end portions of the bar for forming the surfaces of the bar in contact with the opposed, track carrying trucks of the vehicle.

3,659,671
TAG WHEEL LIFT
Alvin L. Heinze, Weld County, Colo., assignor to H & L Tag Lift Corporation, Denver, Colo.
Filed Jan. 23, 1970, Ser. No. 5,263
Int. Cl. B62d 61/12; B60g 5/00
U.S. Cl. 180—24.02 11 Claims

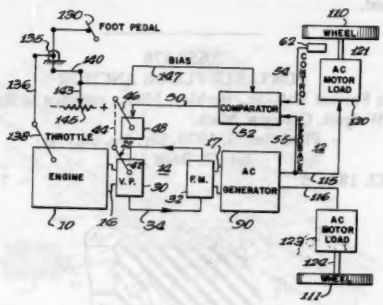


A spring seat is mounted on each end of a pivot shaft which is mounted transversely of the truck frame between the drive wheels and tag wheels and is pivoted by a rocker arm pivotally connected to the piston rod of a hydraulic cylinder. A roller for engaging the rear end of the corresponding drive wheel leaf spring is mounted at the front upper corner of the spring seat, while a pivot pin for the front end of the corresponding tag wheel leaf spring is mounted at the lower rear corner of the spring seat. The rear end of each tag wheel leaf spring extends into a rear seat attached to the frame, engaging a roller in the rear seat. Lift of the tag wheels is produced when the spring seat is pivoted hydraulically, while the spring seats permit equalization of the load between the drive wheels and the tag wheels. The hydraulic cylinder may be single acting or double acting, but if the latter, a lost motion link is pivoted between the piston rod and the rocker arm.

3,659,672
CONTROL SYSTEM
Charles J. Jacobus, C/O Charles Equipment Co. 17W601 North Avenue, Villa Park, Ill.
Original application July 3, 1969, Ser. No. 839,037, which is a continuation-in-part of application Ser. No. 801,644, Feb. 24, 1969, now Patent No. 3,558,901, dated Jan. 26, 1971. Divided and this application Jan. 11, 1971, Ser. No. 105,306
Int. Cl. B60l 11/08
U.S. Cl. 180—65 R 3 Claims

A control system using a motive source and connected hydrostatic transmission to drive a load at a speed determined by the volume of fluid flowing in the transmission. A comparator and actuator change the volume of fluid flow in proportion to the deviation between a feedback signal and a

control signal. The feedback signal is generated by a sensor responsive to the output of the transmission. The control signal has a value dependent upon the type of load connected to the transmission.

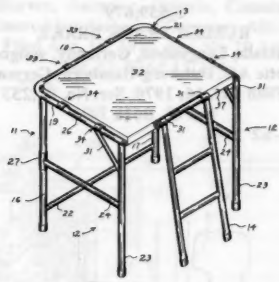


3,659,673

PORTABLE REFEREE STAND

Harold J. Enneking, P. O. Box 789, Hastings, Nebr.

Filed Dec. 31, 1970, Ser. No. 103,207
Int. Cl. E04g 1/34
U.S. Cl. 182—115 6 Claims



A portable platform apparatus adapted for the vertical support of a volleyball referee, the apparatus having a vertical front frame; a pair of vertical end frames, a top horizontal frame; and a ladder; the combination providing an elevated horizontal support platform which is hingedly collapsible into a compact unit that is easily carried.

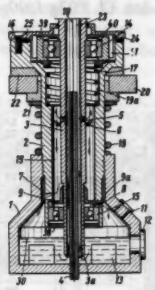
3,659,674

ATOMIZED OIL LUBRICATING DEVICE FOR BEARINGS AND/OR JOURNALS OF VERTICAL SHAFTS ROTATING AT HIGH SPEEDS

Luigi Ferrario, Mandello del Lario, Como, Italy, assignor to Ferrario Andrea A Figli Di Ferrario, Evangelista e Figli, Como, Italy

Filed Dec. 16, 1969, Ser. No. 885,655
Claims priority, application Italy, Sept. 10, 1969, 21835 A/69
Int. Cl. F16n 7/32
U.S. Cl. 184—6.16 10 Claims

A vertical shaft rotatable at high speeds and provided with bearings and/or journals has an axial bore at its lower end immersable into lubricating oil in a tank. Openings in said shaft communicate the bore with a housing defined between the shaft and a tubular casing therefor. Oil sucked up said bore is atomized by passing through said openings. Atomized oil lubricates the journals and/or bearings and condensed oil flows back to the tank.

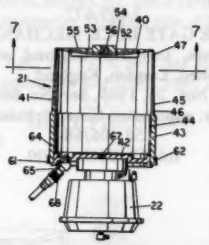


3,659,675

LUBRICATION SYSTEM AND RESERVOIR THEREFOR

Harold P. Edelstein, Bexley, and Roy B. Smith, Washington Court House, both of Ohio, assignors to Transportation Specialists, Inc., Columbus, Ohio

Filed July 7, 1969, Ser. No. 839,572
Int. Cl. F16n 11/00
U.S. Cl. 184—39 8 Claims



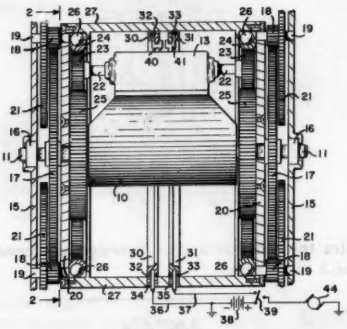
A lubrication system consisting of a metering valve for providing a measured quantity of lubricant to parts to be lubricated, a pump for moving lubricant to the metering valve through distribution lines, and a reservoir dispenser of novel design from which the pump draws lubricant. The reservoir dispenser is formed of (1) a bag of flexible impermeable plastic, and (2) a rigid flat bottom plate to which the open end of the bag is fastened and sealed. The top of the bag is opposite to the open end, is relatively rigid, and is provided with a check valve which allows egress of fluid from the bag but not ingress. A pair of crossed ribs are formed on the underside of the top to prevent undesired sealing of openings in the flat bottom plate. The side walls of the bag are relatively thick for the lower approximately one half portion and are relatively rigid throughout such portion. The upper slightly more than one half portion of the side walls is thinner, relatively flexible, and tapers to the portion adjacent the top. The portion adjacent the top is thinnest so that under atmospheric or higher pressure the upper portion of the side walls folds down into the interior of the bag as the top descends into the bag. The flat bottom plate is provided with two automatic valves, one being an outlet check valve allowing egress from the bag but not ingress. This outlet valve is connected to the pump for supplying lubricant to the meter valves. Lubricant is supplied to the reservoir as needed through an inlet valve in the bottom plate, but except when lubricant is being supplied to the reservoir, the inlet valve is sealed. A quick-connect lubricant fitting is secured to the inlet valve.

3,659,676

SPRING MOTOR MECHANISM

Fenwick L. Witt, 630 Virginia Avenue, Boulder Creek, Calif.

Filed Jan. 25, 1971, Ser. No. 109,131
Int. Cl. F03g 1/00
U.S. Cl. 185—40 R 6 Claims



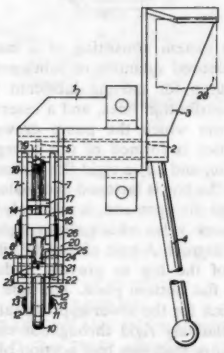
A spring motor mechanism which is provided with a coil spring having one end attached to a power shaft and having the other end attached to an electric motor that is supported so as to describe an orbit around the spring during the winding of the spring when the motor is energized.

3,659,677

CAGE GATE LOCK MECHANISMS

Alan John Shalders, Tolworth, England, assignor to A.C.E. Machinery Limited, London, England

Filed Nov. 26, 1969, Ser. No. 880,124
Claims priority, application Great Britain, Dec. 9, 1968, 58,406/68
Int. Cl. B66b 13/00
U.S. Cl. 187—61 4 Claims



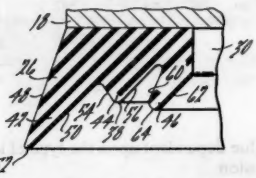
A gate lock mechanism for the cage of a hoist, said mechanism comprising a latch member arranged to normally engage a gate of the cage to prevent opening of said gate and pivotally mounted on a fixed axis, an operating member also mounted on said axis and arranged to move said latch member into and out of engagement with the gate and means for preventing the latch member from being moved out of engagement with the gate when a cage on which said mechanism is mounted is not opposite a landing of the hoist, said preventing means comprising a first lever pivotally mounted at one end on said fixed axis and a second lever pivotally mounted at the other end of the first lever, the arrangement being such that when the cage is not opposite a landing and the operating member is actuated, the second lever is engageable with a stop to prevent further movement of said operating member and ensure that the latch member remains in a position in which it prevents the gate from being opened.

3,659,678

PORTABLE FLOOR ANCHOR

Bertie Forrest Hall, Jr., Berkley, Mich., assignor to Raymond P. Wolgast, Clawson, Mich.

Filed Nov. 4, 1970, Ser. No. 86,776
Int. Cl. B60t 1/14
U.S. Cl. 188—5 7 Claims



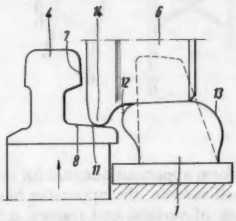
A portable floor anchor which is designed for use in automobile body repair shops. The anchor can be moved about a garage floor on retractable wheels to a job where it is to be used. When the wheels are retracted, a special seal is brought into contact with the floor to create a vacuum chamber. This chamber is evacuated to hold the anchor in place by differential air pressure. A clevis, a pivoted pulling post or other pulling or attaching means are mounted on the anchor.

3,659,679

RUBBER TRACK BRAKE

Franz H. Preinfalk, Langenfeld, Germany, assignor to August Thyssen-Hutte AG, Duisburg-Hamborn, Germany

Filed Oct. 16, 1970, Ser. No. 81,233
Int. Cl. B61k 7/02
U.S. Cl. 188—62 2 Claims



A rubber track brake for braking rolling rail vehicles such as freight cars and the like, having parallel rails of a rubber material laid in longitudinal section of track in place of the normal rails, guiding rails are disposed alone side the rubber rails and have a contact surface for the flanges of car wheels. The rubber rails are securely fixed to a foundation and the guiding rails are capable of being vertically displaced to engage and disengage the track brake of the invention.

3,659,680

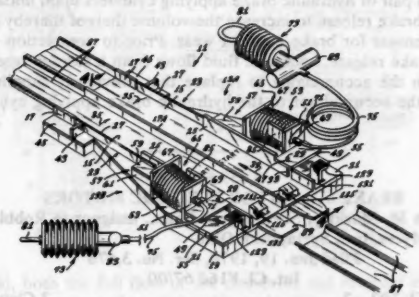
BRAKE MECHANISM FOR MINIATURE TOY VEHICLES

George Soulakis, Los Angeles, and William A. Staats, Torrance, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Oct. 30, 1969, Ser. No. 872,496
Int. Cl. B61k 7/08
U.S. Cl. 188—62 11 Claims

A brake mechanism toy for use with powered or unpowered miniature toy vehicles that travel along a track or

roadway whereby a braking or decelerating action is externally applied to these vehicles. The mechanism includes a controlled braking portion which causes the engagement of selected ones of these vehicles between itself and one side wall of the roadway. The extent of the engagement and



therefore the degree of deceleration action provided is controlled by the user.

In conjunction with the braking mechanism, or used separately, a starting mechanism may be provided which includes a starting post which movably extends above the roadway surface to raise the rear end of the toy vehicle until it is desired that the vehicle accelerate along the roadway.

3,659,681

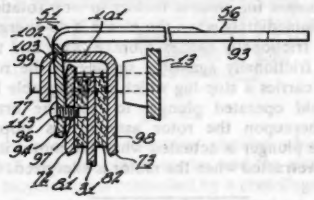
LEVER ACTUATED DISK BRAKE

Dennis G. Harvey, Ancaster, Ontario, Canada, assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Apr. 16, 1970, Ser. No. 29,140

Int. Cl. F16d *55/224*

U.S. Cl. 188—72.9 **7 Claims**



A compact disk brake having a pair of brake shoes floatingly mounted on a pair of pins and a brake operating lever which is operative to move the shoes into engagement with opposite sides of a brake disk. One of the shoes is U-shaped and presents two pairs of openings through which the pins extend.

3,659,682

BI-DIRECTIONAL TORQUE LIMITING BRAKE MECHANISM

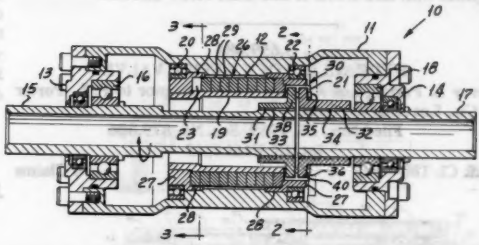
Marvin Meyer, West Caldwell; Salvatore Avena, Newark, and Robert L. Leiner, Pompton Lakes, all of N.J., assignors to Curtiss-Wright Corporation

Filed Nov. 13, 1970, Ser. No. 89,168

Int. Cl. B60t *7/12*

U.S. Cl. 188—134 **16 Claims**

The bi-directional torque limiting brake mechanism comprises two coupling members coaxially supported for relative rotation within a housing and in closed spaced relationship to a braking surface formed on the housing. A coil spring is disposed in the space adjacent the braking surface and in constant drivable connection at its ends with the coupling members. A switching means is connected to an input shaft to be rotated by the latter and to an output shaft to rotate the latter. The switching means is in rotative engagement with each of the coupling members to transmit rotation in one direction to one coupling member and in the opposite direction to the other coupling member so that rotation is



transmitted through the spring in a direction tending to uncoil the spring in both directions of rotation of the input shaft. The coil spring is preloaded to a predetermined torque load value so that the coils expand at the predetermined torque value and engage the housing braking surface and thereby cease transmission of rotation from the input shaft to the output shaft.

3,659,683

ELECTROMECHANICAL SHIFTING DEVICE

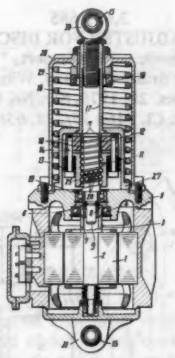
Rudolf Betzing, Altendorfer Strasse 166a, 427o Altendorf-Ulfkotte, Germany

Filed Apr. 20, 1970, Ser. No. 30,110

Claims priority, application Germany, Apr. 25, 1969, P 19 21 252.3

Int. Cl. F16d *65/34*

U.S. Cl. 188—162 **8 Claims**



A plunger is adapted to transmit external work to a shifting member. A transmission comprises a screw having male screw threads, a nut which is formed with female screw threads which surround said male screw threads and define a helical guide path therewith, revolving elements disposed in said guide path between and guided by and coupling said male and female screw threads, means for continuously moving said revolving elements in and along said guide path and through the same and back into said guide path, and means holding said nut against rotation. Said transmission is adapted to transform a rotational drive movement of a motor shaft of an electric stop motor into a linear working movement of said plunger. A freewheel clutch is disposed between said

motor shaft and said screw and adapted to rigidly couple said motor shaft and screw for rotation in one direction and to uncouple said motor shaft and screw for relative rotation in the opposite direction. Shock-absorbing means are disposed between a holder for the device and the shifting member. The periphery of the freewheel clutch substantially coincides with the periphery of an imaginary cylinder which is contiguous with said crests of said male screw threads.

3,659,684

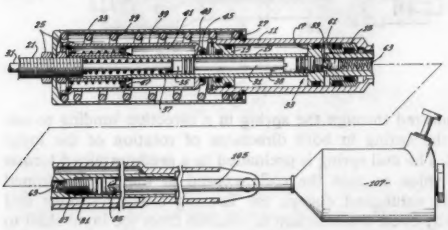
HYDRAULIC LOCK REFILL VALVE

Percy L. Porter, Los Angeles, Calif., assignor to P. L. Porter Co., Los Angeles, Calif.

Filed Nov. 25, 1969, Ser. No. 879,806

Int. Cl. F16f *9/43*

U.S. Cl. 188—322 **6 Claims**



A refill valve for use in an hydraulic locking device such as that utilized in a chair to control the angle between the backrest and the seat. The refill valve comprises a fluid passageway for refilling the hydraulic locking device, a check valve being mounted within the passageway, having an extension thereon for cooperation with an oil can or other delivery means to open the check valve during refilling and also to allow relief of any over-pressure which may occur during the refilling. Additionally, the refill valve is adjustable within the hydraulic locking device so as to control the override function of the locking valve in the device.

3,659,685

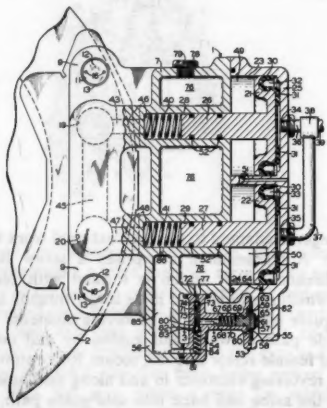
SLACK ADJUSTER FOR DISC BRAKE

Joseph G. Stipanovic, McKeesport, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Oct. 28, 1970, Ser. No. 84,725

Int. Cl. F16d *55/228, 65/74*

U.S. Cl. 188—72.5 **12 Claims**



A pneumatically controlled hydraulically actuated disc-type brake mechanism for use on a wheel and axle assembly of a railway vehicle truck includes a hydraulic-type slack adjuster mechanism automatically operative to compensate for wear of a braking element. The hydraulic-type slack adjuster mechanism comprises a variable volume accumulator into which a hydraulic medium or fluid is forced upon the occurrence of wear of a braking element while a brake application is in effect and from which hydraulic fluid subsequently flows to two pair of hydraulic brake applying cylinders upon initiating a brake release to increase the volume thereof thereby to compensate for brake element wear. Prior to completion of the brake release, hydraulic fluid flows from a storage reservoir to the accumulator to replace that previously supplied from the accumulator to the hydraulic brake applying cylinders.

3,659,686

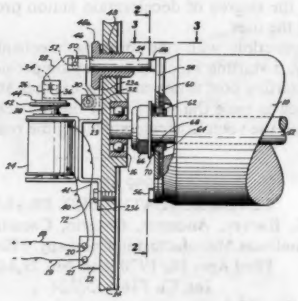
BRAKE MEANS FOR ELECTRIC MOTORS

Joseph M. Markley, Southington, Conn., assignor to Robbins & Myers, Inc., Springfield, Ohio

Filed Jan. 19, 1970, Ser. No. 3,676

Int. Cl. F16d *67/00*

U.S. Cl. 192—2 **3 Claims**



A brake means for electric motors to stop rotation of the drive shaft immediately when the motor is de-energized. The motor shaft frictionally carries a brake plate and the brake plate bears frictionally against a surface of the rotor. The brake plate carries a stop-lug which is engageable by means of a solenoid operated plunger to stop the brake plate abruptly whereupon the rotor assembly is stopped frictionally. The plunger is actuated when the motor is de-energized and is retracted when the motor is energized.

3,659,687

FLUID DRIVE TRANSMISSION WITH RETARDER AND CONTROLS

John O. Edmunds, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

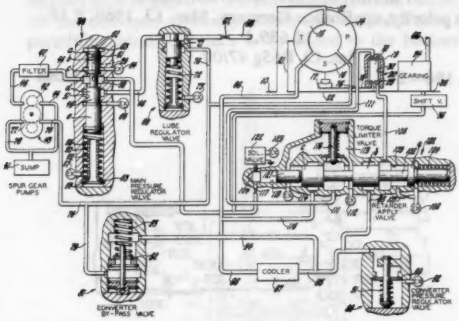
Filed Sept. 21, 1970, Ser. No. 73,782

Int. Cl. F16d *67/00, 33/00*

U.S. Cl. 192—4 B **3 Claims**

A transmission having a torque converter and a hydrodynamic retarder and a three gear dual pump feed system. One pump supplies fluid through a filter to the main line and the main line regulator valve which regulates main line pressure at a high value and supplies the excess fluid to the lubrication line. The lubrication regulator valve regulates lubrication line pressure at a lower value and supplies the excess fluid to the converter line, supplementing the fluid supply from the other pump to the converter inlet. The converter inlet pressure is regulated at a further lower value by a converter bypass valve and the excess fluid supplied to a bypass line. The converter outlet line and the retarder outlet line regulated at a still lower pressure is connected through the cooler to the bypass line which is connected by a retarder valve in the retarder on position to the retarder inlet. A con-

verter regulator valve limits the pressure in the bypass line to a low value so that the retarder is supplied by all available



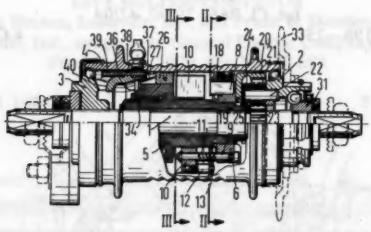
fluid, both the full flow of the converter and retarder outlet and any excess flow from the main line and lubrication system.

3,659,688

CENTRIFUGALLY OPERATED CLUTCH IN A TWO-SPEED BICYCLE HUB

Horst Schulz, Schweinfurt, Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Germany

Filed Aug. 27, 1970, Ser. No. 67,306
Claims priority, application Germany, Sept. 11, 1969, P 19 45 972.4
Int. Cl. F16d *43/24*
U.S. Cl. 192—105 CE **14 Claims**



One of the two pawl-and-ratchet clutches which connect the hub shell with the planet carrier and the ring gear in a two-speed bicycle hub is controlled by a centrifugal governor whose two flyweights are pivotally mounted on a common carrier with the pawl of the controlled clutch. A coupling disc is mounted on the carrier by means of a bearing pin whose axis is spacedly parallel to the hub axis. The disc is tilted by engagement with connecting pins on the flyweights, thereby coupling the flyweights for joint swinging movement about the respective pivot axes in the same direction, and preventing malfunctioning of the clutch by movement of the flyweights under the influence of forces other than centrifugal forces. A cam on the coupling disc holds the controlled pawl disengaged when the flyweights are near the axis of rotation.

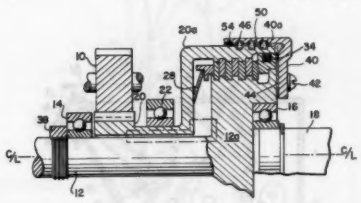
3,659,689

SEAL DEVICE

Arnold Schindel, Fairlawn, N.J., assignor to The Singer Company, New York, N.Y.

Filed Oct. 8, 1970, Ser. No. 79,025
Int. Cl. F16d *13/74*
U.S. Cl. 192—112 **9 Claims**

A seal device for restricting flow of a fluid, such as a mixture of air and vapor, between two pressure areas established with respect to a rotary member, wherein the rotary member and its drive member form a channel therebetween and each has a plurality of spaced annular grooves formed on a surface thereof, with the grooves on the rotary member adapted to register with the grooves on the drive member to form axially



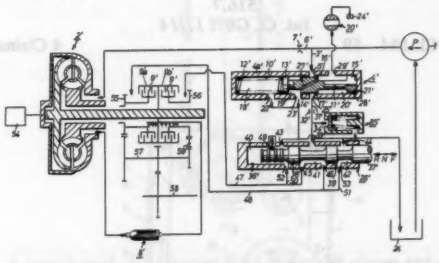
spaced annular chambers extending between the pressure areas. A sealing fluid is disposed in the grooves and in the channel to provide the seal. The device may be incorporated in a clutch assembly whereby actuation of the clutch pressurizes the sealing fluid.

3,659,690

TRANSMISSION CONTROL SYSTEM FOR VEHICLES

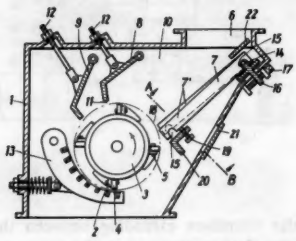
Shin Kitano, and Yutaka Momose, both of Kariya, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya-shi, Japan

Filed Sept. 1, 1970, Ser. No. 68,607
Claims priority, application Japan, Sept. 3, 1969, 44/83844; Nov. 12, 1969, 44/90701
Int. Cl. F16d *25/12, 33/12, 33/02*
U.S. Cl. 192—3.33 **10 Claims**



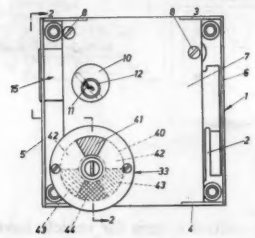
A transmission control system for vehicle having a transmission fluid actuated clutch means connected to a torque converter and a hydraulic brake means for arresting movement of the vehicle, comprising a source of pressurized fluid, first fluid passageway means connecting said fluid source with said clutch means, a regulator valve means disposed within said first passageway means and automatically controlling hydraulic pressure for said clutch means in response to the prime engine revolution rate, manual means to selectively regulate the passage of pressurized fluid to said clutch means, a second passageway means communicatively connecting said pressure fluid source with said torque converter disposed therein, a relief valve means interposed within said second passageway means and regulating output hydraulic pressure from said torque converter, and a control valve means to make said regulator valve means inoperative in response to activation of the brake pedal of the vehicle.

3,659,691
MATERIAL SUPPLY CHUTE
Helmut Leutelt, Innsbruck, Austria, assignor to Hazemag Hartzerkleinerungs-Und Zement-Maschinenbau-Gesellschaft m.b.H., Muenster, Germany
Filed Dec. 31, 1969, Ser. No. 889,590
Claims priority, application Austria, Jan. 3, 1969, A 41/69
Int. Cl. B65g *11/80*
U.S. Cl. 193—2 C 20 Claims



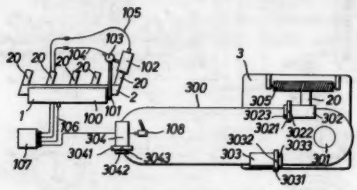
A plurality of discrete bar elements are arranged in side-by-side relationship and together constitute a material supply chute having a general plane. Means are provided for individually displacing the bar elements with reference to this general plane so that individual bar elements can be disposed upwardly or downwardly with reference to the others.

3,659,692
COIN LOCK HAVING DISC TO INDICATE READINESS OF LOCK
Heinz Ten Eicken, Velbert, Germany, assignor to Firma Schlossfabrik Schulteschlagbaum A.G., Tonisheide, Germany
Filed Mar. 30, 1970, Ser. No. 23,799
Claims priority, application Germany, Apr. 5, 1969, P 19 17 516.7
Int. Cl. G07f *17/14*
U.S. Cl. 194—59 4 Claims



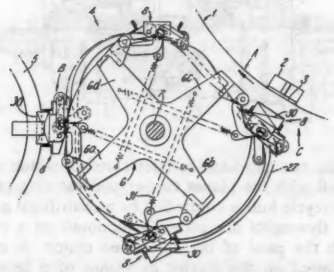
A coin lock, particularly for baggage storing boxes, including means for controlling the time period of use of said box, which comprises a lock box having a lock bottom and a lock cover, and a cylinder lock is secured to the lock cover. The cylinder lock includes a key-operated cylinder core and a locking bolt has a driving slot receiving a driving pin controlled by the cylinder core. A stepwise operated switching work, operable from the outside and controlled by an indicating disc, is coupled with the locking bolt. The stepwise operated switching work has a locking cam movable from a locking-readiness position from the outside into a position blocking the return closing movement of the bolt, and is displaceable by the return closing movement of the bolt into its original, starting position.

3,659,693
LOADING DEVICE FOR PROCESSING MACHINES
Karl Muller, Theodorenstr. 6-8, 6200 Wiesbaden, Germany
Filed Nov. 3, 1969, Ser. No. 873,364
Claims priority, application Germany, Mar. 13, 1969, P 19 12 659.1
Int. Cl. B65g *47/00*
U.S. Cl. 198—20 8 Claims



A mechanism for feeding workpieces to a machine includes a conveyor system for moving workpiece receptacle to a machine at a constant speed and reciprocating loading means for transferring workpieces to the receptacles from a fixed station, the loading means being synchronized with the movement of the receptacles when moving in the direction to feed a workpiece.

3,659,694
PACKING OR WRAPPING MACHINE OF THE MOULD WHEEL TYPE
Richard William Harris, London, England, assignor to Molins Machine Company Limited, London, England
Filed Aug. 28, 1970, Ser. No. 67,880
Claims priority, application Great Britain, Sept. 5, 1969, 44,089/69
Int. Cl. B65g *29/00, 47/04*
U.S. Cl. 198—25 4 Claims

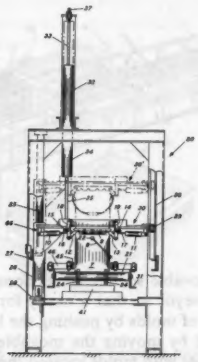


Apparatus for transferring unwrapped cigarette packets from a wheel conveyor into the pockets of a mould wheel wrapping machine. The apparatus comprises a rotary four-armed spider between the two wheels with a carrier pivoted from the end of each arm of the spider. Each carrier has a cam follower to move it radially, a cam follower to pivot it bodily, and a cam follower to open and close grippers pivotally mounted on the carrier. Each cam follower coacts with a stationary cam.

3,659,695
PAIL STACKER
Donald H. Reese, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.
Filed Jan. 11, 1971, Ser. No. 105,200
Int. Cl. B65g *57/30*
U.S. Cl. 198—35 13 Claims

Pail engaging means are mounted on opposing sides of a vertical frame means which straddles a moving conveyor. A

first gate means stops pail from proceeding through the vertical frame means until a stack of pails is formed and then releases the completed stack to the conveyor. A lift means enables pails engaged by the pail engaging means to be raised off the conveyor upwardly within the vertical frame means, permitting additional pails to be added to the bottom of an



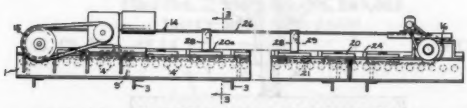
uncompleted stack when the pails engaged by the pail engaging means are lowered to rest on an incoming pail. A second gate means permits additional pails to pass into the vertical frame means when the conveyor pathway is not obstructed and prevents pails from passing into the vertical frame means when a pail is stopped on the conveyor by said first gate means.

3,659,696

LIVE ROLLER CONVEYOR

Cecil S. Denton, Louisville, Ky., and Frank D. Denzler, Jeffersonville, Ind., assignors to General Electric Company

Filed Sept. 9, 1970, Ser. No. 70,683
Int. Cl. B65g *13/02*
U.S. Cl. 198—127 **5 Claims**



A belt-driven live roller conveyor in which the drive area is separated from the conveyor area by a longitudinally extending guide member. A drive belt is disposed above the rollers with its lower drive pass engaging the upper surface of the rollers in the drive area. Spaced pressure members are removably positioned on the belt in the drive area, these members comprising a pair of spaced rolls riding on the drive belt pass and a frame supporting the rolls in spaced relationship so that they bridge at least one conveyor roller. Means are also provided for preventing the pressure members from traveling with the belt.

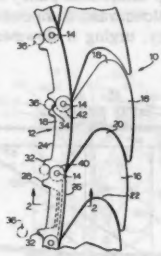
3,659,697

CONVEYOR LINK

Warren A. Brackmann, Cooksville, Ontario, and Daniel Dilanni, Toronto, Ontario, both of Canada, assignors to Rothmans of Pall Mall Canada Limited, Toronto, Ontario, Canada

Filed Apr. 14, 1970, Ser. No. 28,303
Claims priority, application Great Britain, Sept. 30, 1969, 48,090/69
Int. Cl. B65g *15/00*
U.S. Cl. 198—136 **9 Claims**

A rigid link for a conveyor chain includes a rigid platform to support a load and means to pivotally connect links to each other to form a chain and for pivotal movement about an axis substantially perpendicular to the plane of the platform. Means is provided to one side of the platform to coact with other like parts of like links when the links are joined



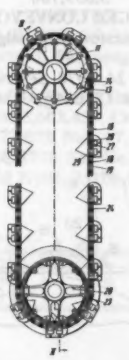
together to form a chain to space the platforms of the links apart from each other when the chain is formed into a helix. A conveyor chain capable of formation into a self-supporting helix is provided from a plurality of such links articulated together.

3,659,698

CHAIN CONVEYOR

Werner Helmut Rieger, 7084 Unterkochen/Wuerttemberg, Haus Haeselbach, Germany

Filed Aug. 12, 1969, Ser. No. 849,390
Int. Cl. B65g *17/12*
U.S. Cl. 198—140 **7 Claims**



A round-steel chain having links in parallel planes and connected by crosspins, the pins having rings which support the chain in the region of driving or supporting sprocket wheels, there being at least four links between every two intermediate rings on crosspins connected to preceding and following crosspins.

3,659,699

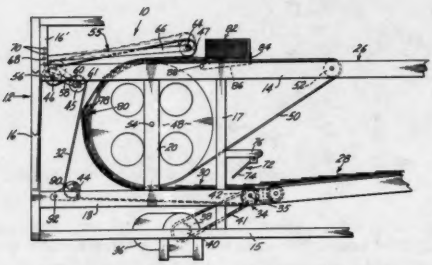
CONVEYOR MECHANISM

Leo O. Donahue, and Roy E. Behrens, both of Highland, Calif., assignors to Graphic Engineers, Inc., San Bernardino, Calif.

Filed July 17, 1970, Ser. No. 55,722
Int. Cl. B65g *15/14*
U.S. Cl. 198—165 **5 Claims**

Overlapping signatures are transported between upper and lower belts, wherein the upper belt passes around three pulleys, the first of which is supported at the free end of a vertically swingable first arm extending generally horizontally from its pivot. The second pulley is carried on a second, ver-

tically swingable arm. Springs pull downwardly on the free end of the second arm to tension the belts. The third pulley is journaled on the pivot axis of the second arm. The belts pass over the third pulley, under the second and over the first. The line of pull of the belts extends from the top of the second pulley to the top of the first pulley at an angle to the horizontal such that a downward component of force is exerted on the first pulley, urging it downwardly against the



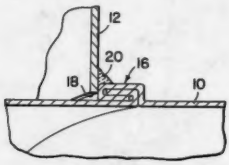
signatures. The first pulley rises and falls with the first arm to accommodate variations in thickness of the line of signatures. The second pulley rises and falls approximately the same distance as the first to accommodate the length of the upper belt to the increased bulk of bunched-up signatures traveling on the conveyor, while maintaining the same angle of pull on the first pulley, with respect to the horizontal, so that the downward component of force remains the same.

3,659,700

AUGER CONVEYOR

William Tunderman, Barstow, Ill., assignor to Deere & Company, Moline, Ill.

Filed Sept. 24, 1970, Ser. No. 75,122
Int. Cl. B65g *33/24*
U.S. Cl. 198—213 **15 Claims**



An auger conveyor including a cylindrical core tube composed of a spiral-wound strip and having a raised spiral seam on its external surface, and spiral flighting connecting externally to the core tube, the flighting having a spiral inner edge parallel with and abutting the seam of the tube. The core tube and flighting assembly is rotatable relative to a housing to advance material therealong, the housing consisting of a spiral-wound cylindrical tube having an internal raised seam extending in close proximity to the outer edge of the flighting and acting as a stripper therefor.

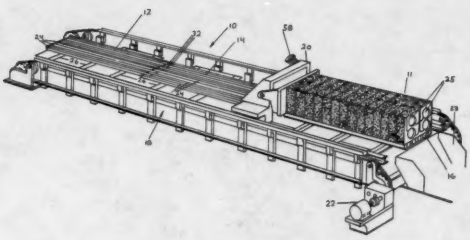
3,659,701

COOLING CONVEYOR

Russell W. Taccone, 1960 Lakeside Drive, Erie, Pa.

Filed May 4, 1970, Ser. No. 34,470
Int. Cl. B65g *25/08*
U.S. Cl. 198—221 **18 Claims**

A cooling conveyor is disclosed for receiving a line of molds from a mold forming machine. The conveyor includes a plurality of conveyor sections having adjacent end portions which interfit so the conveyor sections together define a continuous conveyor surface. One or more individual sections may be moved to make the overall length of the conveyor shorter than the length of a line of molds on the conveyor so that a mold may be dropped from the end of the shortened



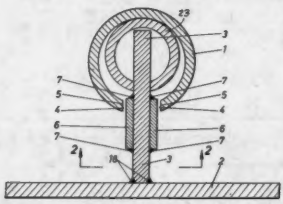
conveyor. The movable section or sections may be moved to lengthen the conveyor so that a newly formed mold may be added to the line of molds by pushing the line of molds along the conveyor and by moving the movable conveyor section or sections together with molds located thereon.

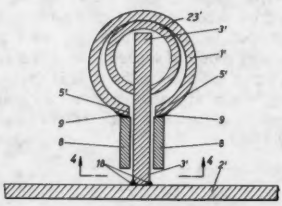
3,659,702

CONVEYOR, PARTICULARLY FOR CHIPS

Helmuth Assauer, Wuppertal-Elberfeld, Germany, assignor to Firma Kobo Kohler & Bovenkamp G.m.b.H., Wuppertal-Barmen, Germany

Filed June 19, 1970, Ser. No. 47,652
Claims priority, application Germany, June 21, 1969, P 19 31 549.2
Int. Cl. B65g *25/08*
U.S. Cl. 198—221 **2 Claims**





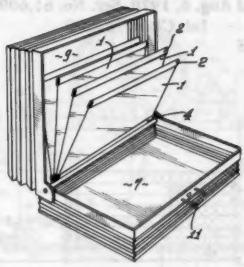
Improvement in a conveyor, particularly for chips, comprising hollow conveyor rods movable back and forth adjacent the bottom of a conveyor trough, said conveyor rods being guided on posts extending from the bottom of the conveyor trough through openings into the inside of the conveyor rods, said conveyor rods having conveying elements including barb-shaped pushing blades which occupy only a fractional portion of the cross section of the conveyor trough, the improvement comprising slide bars associated with the lateral edges of the conveyor rod opening for minimizing wear of the post.

3,659,703

COMPACT FILE FOR STORING PAPERS

Louise Inez Oliver, 538 W. 79th Street, Los Angeles, Calif.

Filed Jan. 16, 1970, Ser. No. 3,456
Int. Cl. A45c 3/02
U.S. Cl. 206—1 A 1 Claim



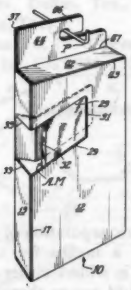
The compact file includes an outside case with an accordion back portion pivoted by sockets to an accordion front portion for movement between open and closed positions; a releasable catch mechanism which selectively holds the portions in the closed position; a plurality of separators, each separator having upper and lower flexible pockets on both sides for receiving papers, a rod means with a spring therein fixed to the separators and extending between the sockets of the portions to removably locate the separators and any papers in the separator pockets in the outside case to be protected thereby.

3,659,704

DISPLAY CARTON HAVING STRUCTURE FOR PRODUCT SUPPORT THEREIN

Peter C. Collura, Stamford, Conn., and William P. Pintsak, Ossining, N.Y., assignors to Container Corporation of America, Chicago, Ill.

Filed Oct. 2, 1969, Ser. No. 863,065
Int. Cl. B65d 5/50, 25/00
U.S. Cl. 206—45.14 1 Claim



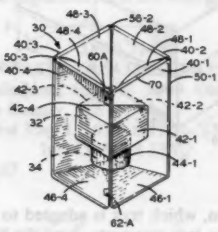
A carton for display of merchandise and having structure for support therein of soft goods such as hosiery or the like. The carton is formed from a cut and scored blank and a support arm is cut out from a front panel thereof, or from a front and side panel thereof, such support arm being folded inward to provide support for an article of merchandise. An aperture is thereby formed for viewing of such merchandise. The container blank is integrally formed with a hanger to suspend the completed carton for display.

3,659,705

TRANSPARENT PACKAGE

Abraham J. Falkin, 33 Remsen Street, Valley Stream, N.Y.

Continuation-in-part of application Ser. No. 826,573, May 21, 1969, now abandoned. This application June 29, 1970, Ser. No. 50,486
Int. Cl. B65d 5/58, 85/30
U.S. Cl. 206—45.34 18 Claims



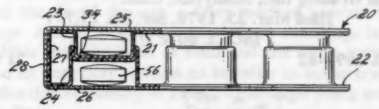
A package device is vacuum formed from a thermoplastic sheet and includes at least three self-hinged outwardly open sector shaped sections closed to form a polyhedral body with the section side walls in juxtaposition and the end sections being joined by fastening means. Cavity delineating inner walls are formed in the inner parts of the sections and join the side walls. The sections may include end walls which delineate the cavity end walls or the inner walls may include cavity end walls joined to the section side and end walls which latter may be curved. Vertical ribs or protuberances may be formed on the end walls or on intermediate shoulders on the cavity walls and outwardly projecting ribs may be formed on vertically extending cavity walls.

3,659,706

PHARMACAL PACKAGE CONSTRUCTION

John J. Serrell, Haverford, Pa., assignor to Parke, Davis & Company, Detroit, Mich.

Continuation-in-part of application Ser. No. 831,557, June 9, 1969, now Patent No. 3,603,453, Continuation-in-part of application Ser. No. 877,075, Nov. 17, 1969. This application Apr. 24, 1970, Ser. No. 31,534
Int. Cl. B65d 21/02, 75/36, 83/04, 85/56
U.S. Cl. 206—56 AB 6 Claims



A pharmacal package construction wherein a pair of blister sheets are closed by respective backing sheets and arranged with the blisters in proximate relation so that the backing sheets are outermost, the blister sheets being provided with detachably interfitting formations, to releasably retain the blister sheets and their backing sheets in position defining a package effectively protected by the backing sheets.

3,659,707

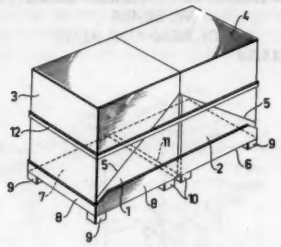
DIVISIBLE TRANSPORT PACKAGE

Lars Olov Nilsson, Farsta; Nils Leo Liljegren, Ekero, and Robert Victorin, Stocksund, all of Sweden, assignors to Sikob AB Svensk Industris Konstruktions Och Beraknigskontor, Selna, Sweden

Filed Dec. 4, 1969, Ser. No. 882,079
Claims priority, application Sweden, Dec. 4, 1968, 16396/68
Int. Cl. B65d 17/00, 71/00
U.S. Cl. 206—65 B 6 Claims

A divisible transport package comprising at least two containers supported by and retaining side-by-side on opposite

sides of a vertical partition plane upon a tray having a bottom portion, suitably supported by feet and having a slot in the plane, and upwardly projecting rims around the periphery of



the bottom portion, which tray is adapted to be divided, for instance by cutting, into two parts along the lines of intersection between the tray and the vertical plane.

3,659,708

SEPARATION OF DISCOLORANTS FROM CLAY

Horton H. Morris; James P. Olivier, both of Macon, Ga., and Sydney Ross, Troy, N.Y., assignors to Freeport Sulphur Company, New York, N.Y.

Filed Nov. 4, 1968, Ser. No. 773,335
Int. Cl. B03b *1/04*; C01b *35/00*
U.S. Cl. 209—5 **6 Claims**

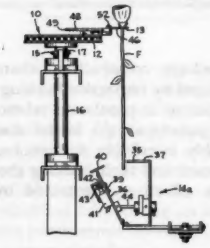
A process for beneficiating a dispersed kaolin clay mass by removing from a dispersed clay mass the contaminant which causes the formation of a thin, dull layer of yellow or brownish-yellow material, commonly referred to as "scum," on surfaces of dried material containing the dispersed clay. The process comprises raising the pH of an aqueous dispersion of the clay to at least 12 and at that pH separating the insoluble clay from the solubilized discoloring contaminant.

3,659,709

METHOD AND APPARATUS FOR SORTING FLOWERS

David S. Bartlett, Jr.; Rupert M. Purcell; David W. Osborne, and Troy F. Smith, Jr., all of San Jose, Calif., assignors to Floral Grading Inc., Sunnyvale, Calif.

Filed Mar. 23, 1970, Ser. No. 21,771
Int. Cl. B07c *1/14*
U.S. Cl. 209—82 **21 Claims**



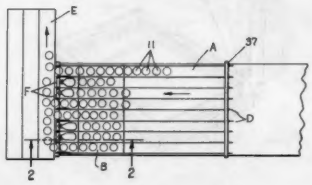
The invention is a method and apparatus for sorting flowers on the basis of stem length. Flowers of random stem lengths are arranged on a first conveyor with their stems aligned in substantially vertical parallel relation. A series of stem length detectors sense various stem lengths whereupon all flowers of similar length are transferred to a corresponding one of a series of storage conveyors. When a desired quantity of similar sized flowers are stored in the storage conveyor, they are transferred by a transfer conveyor to a terminal conveyor where they are grouped for tying and wrapping. Any number of preselected lengths may be grouped but the extremes in stem length are selected first, e.g. the longest, proceeding to the opposite extreme so that the stem length detectors operate like a sieve.

3,659,710

ARTICLE EXTRACTING DEVICE

Joseph Tice, 210 Yorkshire Drive, Greenville, S.C.

Filed Aug. 6, 1970, Ser. No. 61,609
Int. Cl. B07c *7/00*
U.S. Cl. 209—125 **2 Claims**



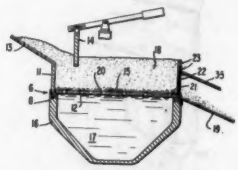
An apparatus for extracting defective articles from a row of articles moving on a conveyor. The apparatus includes a vibrating plate which transfers the articles from the conveyor to a trap door. When the trap door is open the articles are allowed to drop therethrough. When the trap door is closed the articles move thereover to a receiving station. Divider plates are provided for maintaining the articles in rows.

3,659,711

DEVICE FOR GRAVIMETRIC SEPARATION OF GRANULAR OR PULVERULENT MATERIALS

Richard Cohen-Alloro, Orleans, and Jean Grassaud, Boulogne-Billancourt, both of France, assignors to Bureau de Recherches Geologiques et Minieres, Paris, France

Continuation of application Ser. No. 784,158, Dec. 16, 1968, abandoned, which is a continuation-in-part of Ser. No. 621,300, Mar. 7, 1967, abandoned.
This application Mar. 23, 1970, Ser. No. 20,445
Claims priority, application France, Mar. 26, 1966, 55139
Int. Cl. B03b *3/22*
U.S. Cl. 209—457 **4 Claims**



A device for gravimetric separation of granular or pulverulent materials includes a means for creating a series of reciprocating pulsations in a fluid, either air, water or a dense liquid. This pulsating fluid passes through a porous bottom which has pores sufficiently small to retain the dense particles, and means allowing the retention of the dense products. The porous bottom includes a regulatable flow aperture system for the continuous evacuation of the dense products. The products to be treated are poured into a feed channel loading to the porous bottom. A regulatable feed plate above the porous bottom allows regularizing flow of the raw materials. A pouring sill for the light materials is replacable by others which vary in height. The amplitude of the pulsations are system regulatable. A trap is situated in the lower part of the tank.

3,659,712

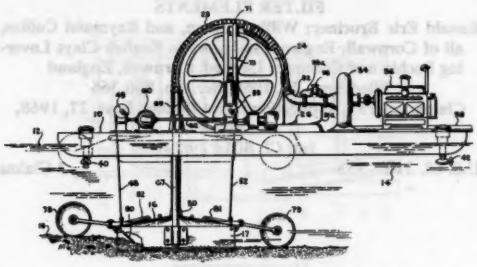
REMOVING DEEP SILT AND MUCK DEPOSITS

Merle P. Chaplin, 609 Drive Avenue, Winter Park, Fla.

Continuation of application Ser. No. 832,125, June 11, 1969, now abandoned. This application Oct. 16, 1970, Ser. No. 82,818

Int. Cl. B01d *21/00*

U.S. Cl. 210—73 17 Claims



A method and apparatus for removing silt, muck and other deposits from a water covered basin whose bottom has been covered with a relatively thick deposit, involving the use of a submerged housing unit supported from the surface in a controlled relationship to the deposits on the bottom of the basin. The submerged unit is provided with a gate at its forward end so as only to permit the entry of silt into the housing at the forward end as it is moved along the bottom, with the arrangement being such that a pressurized jet can be injected into the entering material to enable a workable mixture of water and silt to be achieved. Means are provided for then drawing the mixture to the surface so that the silt can be disposed of at a location outside the basin. Other facets of the invention include the use of automatic means for maintaining the submerged housing unit in a desirable relationship to the silt deposits; the use of a selectively operable gate at each end of the device so as to enable operation in either direction; and automatic means for injecting additional jets of water as needed to maintain proper consistency of the material being discharged.

3,659,713

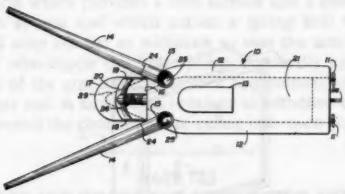
METHOD AND APPARATUS FOR RECOVERING IMPURITIES FROM THE SURFACE OF A LIQUID

Frederick N. Mueller, Dallas, Tex., assignor to Tetradyne Corporation, Dallas, Tex.

Filed Jan. 16, 1970, Ser. No. 3,351

Int. Cl. E02b *15/04*

U.S. Cl. 210—83 10 Claims



Impurities are removed from the surface of a liquid by impinging an elongated fluid stream, preferably a gaseous stream, along a length of the surface and moving the impinging stream relative to the surface causing the impurities to move and concentrate in advance of the impinging action of the stream, and thereafter isolating the concentrated mass of impurities. An apparatus is also provided suitable for traversing a body of water and recovering impurities, such as oil and the like from its surface. A preferred apparatus includes a vessel having a pair of elongated booms which are adapted to extend forwardly and outwardly of the motion of the vessel. Each boom extends above the water and carries nozzles which are adapted for form a substantially continuous elongated gaseous stream for impinging upon the water between the booms to thereby concentrate floating impurities between the booms. In addition, the vessel is provided with impurity inlet means between the booms for collecting the concentrated impurities from the water.

3,659,714

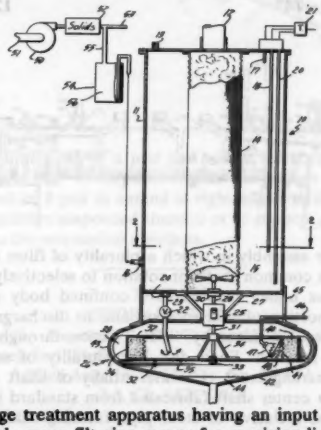
LIQUID WASTE TREATMENT APPARATUS

Joseph M. Valdespino, Suite E 3609 Old Winter Garden Road, Orange County, Fla.

Filed May 1, 1970, Ser. No. 33,622

Int. Cl. B01d *33/02*

U.S. Cl. 210—107 11 Claims



A sewage treatment apparatus having an input tank with mixing and screen filtering means for receiving liquid waste such as raw sewage. The level of liquid waste in the input tank controls a timer which activates a valve to release the screened sewage into a filter centrifuge for rapidly separating liquids and solids in the liquid waste. The solids separated are burned and vacuumed from the filter centrifuge following filtering of the liquid through a filter medium located in the centrifuge. A high speed perforated drum centrifuge is lined with a filter material such as sand and the drum may have vanes on its periphery to form an impeller to act in conjunction with a diffuser casing to form a centrifugal pump integral with the filter.

3,659,715

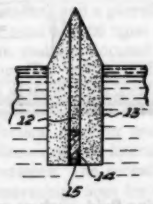
APPARATUS FOR REMOVING OIL FLOATING ON WATER

Amos J. Shaler, State College, and William E. Clancy, St. Marys, both of Pa., assignors to Stackpole Carbon Company, St. Marys, Pa.

Filed July 22, 1969, Ser. No. 843,713

Int. Cl. C02b *9/02*

U.S. Cl. 210—242 11 Claims



An elongated porous member is impregnated with a com-

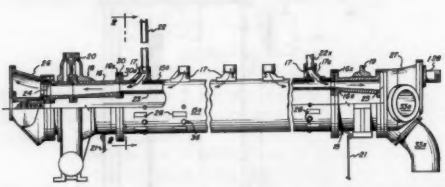
bustible fluid and then floated in a generally upright position in a layer of combustible fluid on a body of water, with the lower portion of the porous member extending down in the water and with its upper portion projecting above the fluid layer. The fluid carried by the upper end of the porous member is ignited to produce a flame that is thereafter fed by combustible fluid moving up through that member by capillary action from the fluid layer, whereby to remove the fluid from the water and burn it.

3,659,716

FILTER ASSEMBLY WITH FILTRATE FLOW CONTROL AND CONTROL COMPONENTS

C. Lynn Peterson, and Clarence John Peterson, both of Salt Lake City, Utah, assignors to Peterson Filters & Engineering Company, Salt Lake City, Utah

Filed Oct. 6, 1969, Ser. No. 863,947
Int. Cl. B01d *33/40, 33/26*
U.S. Cl. 210—247 **12 Claims**



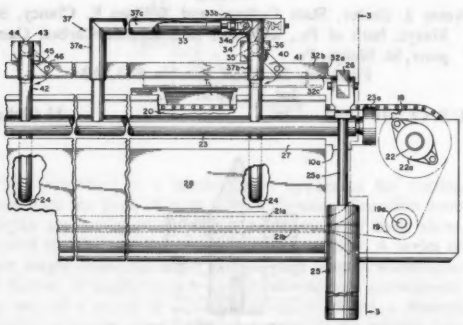
Disc filter assembly in which a plurality of filter discs are mounted on common shaft for rotation to selectively dispose disc surfaces under vacuum in a confined body of slurry through a portion of said rotation and to discharge formed cake from said surfaces by "blow" action through another portion of rotation. Each disc has plurality of sectors in sequential arrangement circumferentially of shaft mounted on a hollow center shaft fabricated from standard industrial components, inclusive of steel pipe forming shaft exterior and plurality of tubular members of oblong section in welded circumferentially spaced arrangement interiorly of pipe providing a conductive passage in communicating relation to at least one sector for applying vacuum and blow thereto under control of filter valve.

3,659,717

APPARATUS FOR REMOVING FLUID FROM A FOOD CONTAINER

Gerald W. Bourbina, Saginaw, Mich., assignor to Baker Perkins Inc., Saginaw, Mich.

Filed June 9, 1969, Ser. No. 831,443
Int. Cl. B01d *35/08*
U.S. Cl. 210—329 **14 Claims**



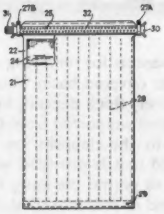
Apparatus for removing fluid, such as grease, from a food container in which food is cooked including mechanism for tilting the container to an inclined position so that the fluid will drain from the container in the inclined position, and a food restraining device which moves therewith. Apparatus is provided for initially lowering the food restraining device to a position adjacent the food so that the device will retain the food in the container during the tilting operation.

3,659,718

FILTER ELEMENTS

Ronald Eric Brociner; William Moon, and Raymond Collins, all of Cornwall, England, assignors to English Clays Lovering Pochin and Company Limited, Cornwall, England

Filed Sept. 23, 1969, Ser. No. 860,366
Claims priority, application Great Britain, Sept. 27, 1968, 46,159/68
Int. Cl. B01d *29/14*
U.S. Cl. 210—333 **3 Claims**



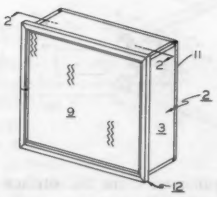
A filter thickener incorporating a filter element which is formed from a bag of filter material substantially filled with a packing material through which liquid can permeate. The filter element is advantageously in the form of a filter leaf which comprises a flat bag of filter material containing packing material in the form of a flexible mat or mesh made from a natural or synthetic polymeric material, and opposing sides of the flat bag of filter material are preferably joined together in a manner which divides the bag of filter material into a plurality of strips or annuli.

3,659,719

FILTER FRAME CONSTRUCTION

Karl L. Westlin, and Wilson A. Welch, both of Louisville, Ky., assignors to American Air Filter Company, Inc., Louisville, Ky.

Filed Dec. 7, 1970, Ser. No. 95,508
Int. Cl. B01d *46/52*
U.S. Cl. 210—483 **4 Claims**



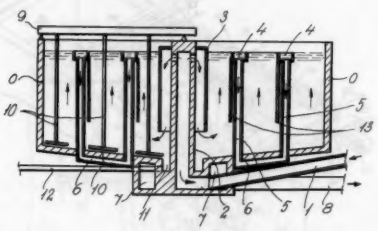
A filter assembly including a filter frame with filter medium disposed therein and a border flange arranged to engage the edge of the filter frame, the border flange being clamped to the frame by resilient means inserted between the filter frame and the flange.

3,659,720

SEDIMENTATION SYSTEM

Lars G. Malm, Lindvagen, Sweden, assignor to AB Purac, Lund, Sweden

Filed Oct. 27, 1970, Ser. No. 84,388
Claims priority, application Sweden, Oct. 31, 1969, 14985/69
Int. Cl. B01d 21/14
U.S. Cl. 210—525 6 Claims



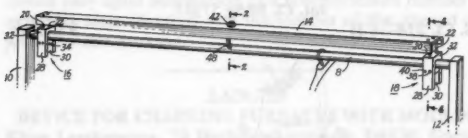
A system for purifying water and sewage by forcing a liquid that is to be sedimented flow from the lower portion of a basin and upwards while sedimented matter in the liquid sinks downwardly in the basin. Concentrically positioned elements are located at the surface of the liquid for draining off purified liquid through fall pipes that interconnect the elements with discharge pipes at the bottom of the basin.

3,659,721

LOCK RACK

Vincent Parillo, Highland Park, N.J., assignor to Bond Stores, Incorporated, New York, N.Y.

Filed Aug. 7, 1970, Ser. No. 62,101
Int. Cl. E05b 73/00
U.S. Cl. 211—7 2 Claims



The application discloses a clothes rack which provides means for locking clothes hangers onto the hanger rod of the rack. These means include a spring pressed channel bar mounted over the hanger rod and adapted to partially embrace the rod and the hangers supported thereon when in its lowermost position. The channel bar has pivoted thereon a rocket arm which provides a cam surface and a shoulder underneath at one end which causes a spring bolt of a lock mounted atop the bar to withdraw so that the arm can pass the bolt whereupon the bolt springs outwardly against the shoulder of the arm to securely lock the channel bar against the hanger rod. A key is then required to withdraw the spring bolt to permit the channel bar to spring into open position.

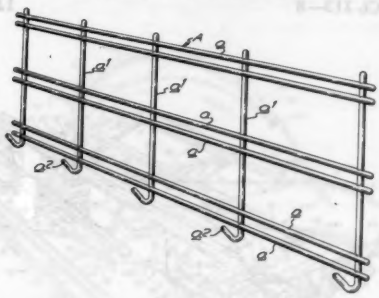
3,659,722

SHELVES AND HOOKS FOR SUPPORTING ARTICLES

Aubrey G. Carroll, Farnham, England, assignor to Auriol (Guildford) Limited, Farnham, England

Filed Dec. 4, 1969, Ser. No. 882,214
Claims priority, application Great Britain, Dec. 8, 1968, 60,070/68
Int. Cl. A47f 5/08
U.S. Cl. 211—106 7 Claims

A substantially vertical rectangular frame formed of a plurality of pairs of parallel horizontal plastic coated rails or wires welded to a plurality of vertical plastic coated wires to support a plurality of suspension members projecting forwardly of the frame each suspension member comprising a substantially U-shaped member with hooked ends to engage over the upper rail of a pair and with a member welded to the base of the U-shaped member to engage under the second rail of a pair to extend at right angles to the frame to support articles suspended thereon or to support a wire shelf welded to the suspension members.

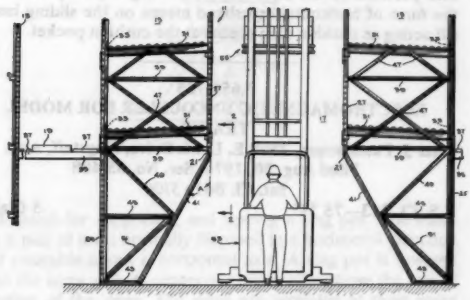


3,659,723

STORAGE RACKS

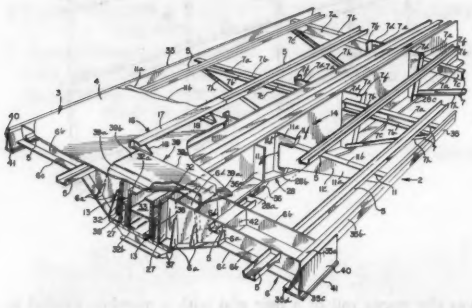
Anthony N. Konstant, Mt. Prospect, Ill., assignor to Speedrack Inc., Skokie, Ill.

Filed Aug. 26, 1970, Ser. No. 67,124
Int. Cl. A47f 5/00
U.S. Cl. 211—151 7 Claims



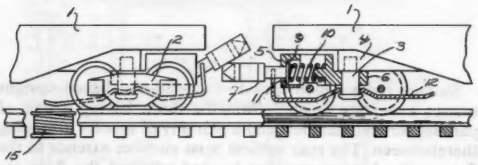
Storage racks which include fore-and-aft aligned upright trusses extending upward from the floor, having a pair of parallel vertical members and a plurality of spacers extending therebetween. The rear vertical truss member extends to the floor and a bottom member located adjacent the floor extends forward from the lower end of the rear vertical member. The front vertical truss member terminates short of the floor and a diagonal member extends between the lower end of the front vertical member and the bottom member. Parallel vertical columns spaced laterally of the truss define a storage bay therebetween. The recessing at the front of the truss provides maneuvering room for lift trucks and thereby reduces the width requirements for service aisles.

3,659,724
RAILROAD FLAT CAR
Roy W. Miller, Highland; Marvin Stark, Michigan City, and William R. Shaver, Munster, all of Ind., assignors to Pullman Incorporated, Chicago, Ill.
Filed May 20, 1970, Ser. No. 39,683
Int. Cl. B61g 9/12; B61d 17/00
U.S. Cl. 213—8 12 Claims



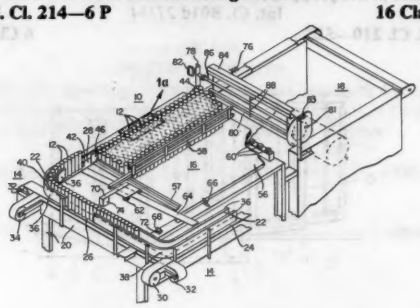
In a cushioned underframe railroad flat deck car, a bolster and crossbearer construction of cross elements extending between each side sill and the fixed center sill and having vertical truss means on the sides of the fixed sill tying the cross elements to the fixed sill, a center plate under the fixed sill tying the bolster cross elements together and a transverse transfer channel member forming a shear box with the deck and tying the bolster cross elements together, sub-cross means under the fixed sill tying the outboard bolster cross elements together, reinforcement about the fixed sill at the fish belly transition section of the fixed sill, and fixed longitudinally vertical cushion key stops on the top and bottom inside portions of the fixed sill and sliding key stop means in the form of horizontal crosshead means on the sliding insert sill acting as cushion stop means at the cushion pocket.

3,659,725
ELECTROMAGNETIC UNCOUPLER FOR MODEL TRAINS
Peter J. Passalacqua, 2808 E. Lewis Drive, Flagstaff, Ariz.
Filed Aug. 20, 1970, Ser. No. 65,408
Int. Cl. B61g 5/00
U.S. Cl. 213—75 TC 5 Claims



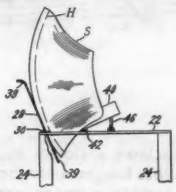
An uncoupler lever is pivotally attached to the truck of a model railroad car, with one end so attached to the resiliently mounted coupler bar of the car that upon movement of the opposite end of the lever, as by an electromagnet, the coupler bar will be deflected to an uncoupled position.

3,659,726
PALLETIZING APPARATUS
John T. Anderson, Churchville, Pa., assignor to Crown Cork & Seal Company, Inc., Philadelphia, Pa.
Filed Apr. 29, 1970, Ser. No. 32,908
Int. Cl. B65g 57/24
U.S. Cl. 214—6 P 16 Claims



A palletizer for accumulating layers of cans in patterns of staggered rows. Initially, the rows of cans are individually and sequentially accumulated on an infeed conveyor at two alternate positions along the conveyor. The rows of cans are then individually and sequentially moved to a layer pattern makeup plate where a layer of cans in a pattern of staggered rows accumulates. The makeup plate is then returned to the position adjacent the conveyor while the layer of cans is stripped from the makeup plate and dropped to a pallet or another layer of cans on the plate.

3,659,727
TABLES FOR STACKING FLEXIBLE WORK
Ralph E. Pearsall, Gloucester, Mass., assignor to USM Corporation, Boston, Mass.
Filed Aug. 13, 1970, Ser. No. 63,518
Int. Cl. B65g 57/03
U.S. Cl. 214—6 H 9 Claims

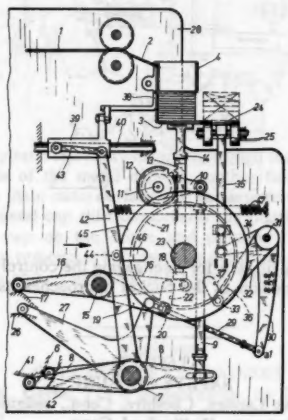


A table has its top fitted with two pivotal work supporting members arranged to be tilted into steeper V-relation in response to the accumulation of flexible work pieces thereon. The table is especially adapted to enable fabric pieces of non-uniform mass, for instance hemmed sleeves, to tend to be self-leveling during stacking.

3,659,728
APPARATUS FOR COLLECTING AND PILING OF DISC-SHAPED OBJECTS
Gunter Reinecke, Wuppertal-Elberfeld, Germany, assignor to Benz & Hilgers GmbH, Dusseldorf, Germany
Filed Nov. 20, 1970, Ser. No. 91,246
Claims priority, application Germany, Nov. 29, 1969, P 19 60 118.4
Int. Cl. B65g 57/03
U.S. Cl. 214—6 H 7 Claims

An apparatus for collecting and piling of disc-shaped objects, as sausage slices and cheese slices, chocolate bars, baking goods and the like comprising a conveyor device, and a

collecting plate and a runway slide. The conveyor device feeds objects to the collecting plate by means of a run slide, means for stepwise lowering the collecting plate are provided in dependency upon the cutting thickness of the objects. A stripping device removing the piled objects, and a receiving plate is arranged for receiving the objects from the collecting plate. The collecting plate, the stripping device and the receiving plate the latter capable of being lifted and lowered,



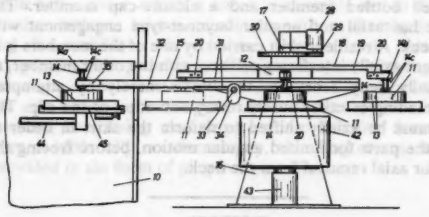
are connected with cam controlled driving units disposed independently from each other. Locking discs capable of being driven by a joint switching drive and alternately moving, are coordinated to the driving units, and the locking discs make possible a freeing of the driving units for lifting the collecting plate and receiving plate and operation of the stripping device only upon termination of a predetermined number of switching steps identical with the number of disc shaped objects of a disc package.

3,659,729

DEVICE FOR CHARGING FURNACES WITH MOULDS

Klaus Lamkemeyer, 70 Huelsbrockerstrasse, D4830, Guetersloh, Germany

Filed Mar. 31, 1970, Ser. No. 24,243
Int. Cl. F27b *9/38*
U.S. Cl. 214—25 **7 Claims**



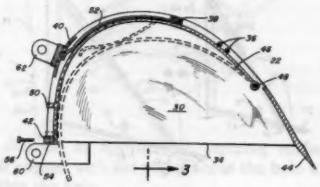
A device for charging furnaces with moulds comprising a plurality of frames, each frame provided with a support axle for supporting an individual mould, forwarding means for sequentially transporting each said frame in a timed sequence and feed means sequentially collecting said frames from said forwarding means and further transporting said frames into and out of said furnace.

3,659,730

SELF-DUMPING BACKHOE BUCKET

Delbert M. Butler, P. O. Box 314, Warner, Okla.

Filed June 8, 1970, Ser. No. 44,328
Int. Cl. E02f *3/60*
U.S. Cl. 214—146 E **5 Claims**



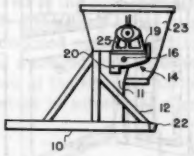
A small width for backhoe type tractors is adaptable for digging small trenches in relatively moist clay or compact materials. The rear closure portion of the bucket is pivotal and spring biased so as to normally force the material from between the tapered sides of the bucket by the combination of the spring force and gravity. Provision is made to latch the pivotal rear portion in a fixed position when digging loose or drier material.

3,659,731

SLAG POT TIPPING STAND

Robert C. Carson, West Sunbury, Pa., assignor to Harsco Corporation, Harrisburg, Pa.

Filed Nov. 6, 1969, Ser. No. 874,573
Int. Cl. B65b *69/00*
U.S. Cl. 214—314 **2 Claims**



A stand for supporting and tipping a slag pot. The stand has a pair of arms normally disposed in a horizontal direction and rotatable about a horizontal axis. A slag pot is lowered onto the arms with its center of gravity offset from the axis of rotation of the arms. The arms are provided at their outer ends with hook-like projections which engage the side portions of the slag pot supporting lugs to prevent the pot from sliding as the arms rotate downwardly from the horizontal position. Counterbalances are provided to return the arms to a horizontal position when the ladle is lifted off the stand.

3,659,732

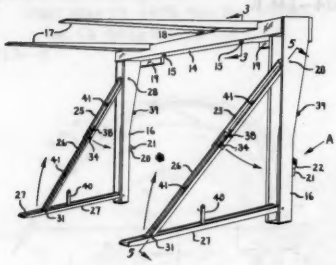
FORK FRAME FOR AN INDUSTRIAL TRUCK

William P. Downey, Portland, Oreg., assignor to Hyster Company, Portland, Oreg.

Filed Sept. 18, 1969, Ser. No. 859,104
Int. Cl. B66f *9/12*
U.S. Cl. 214—621 **8 Claims**

A detachable fork frame for an industrial lift truck is dis-

closed. The fork frame has two legs, each with a folding foot structure which allows it to stand freely when detached from the truck. The structure is designed for rapid mounting and demounting and is self storing.



3,659,733

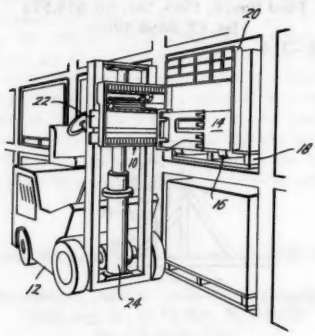
NARROW AISLE ATTACHMENT

Stuart W. Sinclair, and Monroe J. Dennis, both of Houston, Tex., assignors to Anderson Clayton & Co., Houston, Tex.

Filed Dec. 11, 1970, Ser. No. 97,225

Int. Cl. B66f *9/14*

U.S. Cl. 214—730 **7 Claims**



An attachment for conventional industrial lift trucks to enable the truck to work in narrow aisles and manipulate pallets in front of and to both sides of the truck, utilizing a crossed six-bar linkage and side shifter mechanism.

3,659,734

BUCKET POSITIONING DEVICE UTILIZING A BIASED PROXIMITY SWITCH

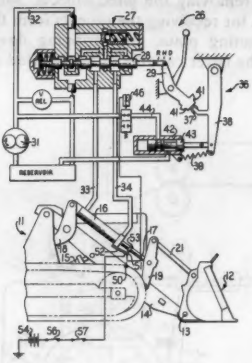
Joe E. Fuzzell, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Original application Apr. 2, 1969, Ser. No. 812,829, now abandoned. Divided and this application June 9, 1971, Ser. No. 151,591

Int. Cl. E02f *5/14, 3/70, 3/28*

U.S. Cl. 214—764 **5 Claims**

In a loader having a bucket pivotably supported upon a lift frame, tilt jacks interconnected between the lift arms and bucket by tilt linkage and a detented control valve by which the tilt jack is operated. A biased proximity switch and actuating magnet are positioned respectively upon the cylinder and rod of the tilt jack for disengaging the control value from a detented position as the bucket approaches its load position.



3,659,735

SAFETY CLOSURE

William James Landen, Cheshire, Conn., assignor to Eyelet Specialty Company, Wallingford, Conn.

Filed May 25, 1970, Ser. No. 40,947

Int. Cl. B65d *55/02*

U.S. Cl. 215—9 **10 Claims**

The invention contemplates selectively openable closure means that is tamper-proof, in the sense that a correct sequence of two deliberate and independent movements of lockable closure elements is necessary in order to achieve access to the contents of the bottle or the like which is protected by the closure.

The specific construction that is described involves a necked bottled member and a closure-cap member. The latter has axial and angular bayonet-type engagement with the neck. A resilient skirt carried by one of the members is in resilient axially interfering relation with the other member, to normally deny access to the bottle merely by attempted unthreading or other purely rotary actuation of the cap. The cap must be axially shifted to deform the skirt in order to free the parts for limited angular motion, before freeing the cap for axial removal from the neck.

3,659,736

CONVENIENCE OPENING BOTTLE CLOSURE

Darius Orley Riggs, Ottawa Lake, Mich., assignor to Owens-Illinois, Inc.

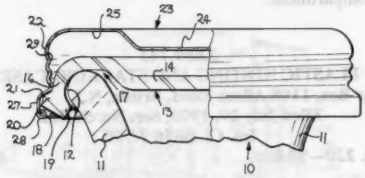
Filed Nov. 20, 1970, Ser. No. 91,292

Int. Cl. B65d *23/00*

U.S. Cl. 215—40 **11 Claims**

The invention disclosed is a convenience opening closure for a glass bottle having an outwardly flared neck and bead at

the finish of the bottle. This is often called a "cruet" finish. A plastic inner closure snaps over the finish and has an outwardly and downwardly tapering circular skirt. A metal cap fits over the plastic closure and the skirt of the cap has a lesser taper to force the plastic skirt to seal the finish of the bottle. The inner skirt wall of the outer cap has threads or projections which cooperate with the skirt of the plastic clo-



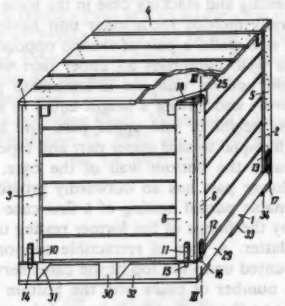
sure. The plastic skirt may have pre-formed threads engaging the threads of the metal cap. In another form, the plastic skirt has a plain outer surface and the interference fit of the threaded metal cap skirt compresses the plastic skirt sealing the inner cap on the bottle and pressing threads in the plastic. Cap removal is by unscrewing the outer cap from the plastic cap and unsnapping the plastic cap from the bottle finish.

3,659,737

COLLAPSIBLE CONTAINERS

Hermann K. Garbe, 115 d Hohnerkamp, c/o 200 Hamburg, Germany

Filed Jan. 8, 1970, Ser. No. 1,357
Int. Cl. B65d *9/12*
U.S. Cl. 217—12 R **13 Claims**



An improved collapsible or dismantlable container with a pallet-shaped base, edgewise insertable, overlapping, side walls and a cover, which is easier to assemble and to dismantle than hitherto known containers, without thereby impairing its stability, wherein the improvement comprises cooperating fixing elements of which one part is arranged on the edges of the base and a second part on the lower edges of the side walls, and locking elements are provided on the top corners, comprising clamping means overlaying these corners. Additionally or alternatively, clamping means may be provided in the form of plug-in connections.

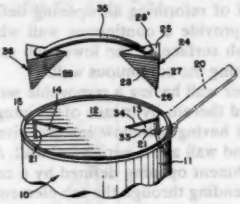
3,659,738

CAN CLOSURE STRUCTURE

David A. Friedmann, 10777 Sprucehill Drive, Springfield Township, Hamilton County, Ohio, and Marvin L. Eisenpresser, 245 E. 63rd Street, New York, N.Y.

Filed June 15, 1970, Ser. No. 46,398
Int. Cl. B65d *41/00*
U.S. Cl. 220—42 B **7 Claims**

A device is provided which sealingly preserves the contents of a container of liquid after a portion of such contents are withdrawn, such device being insertable into a hole formed in the top of the container and there pressed into place whereu-



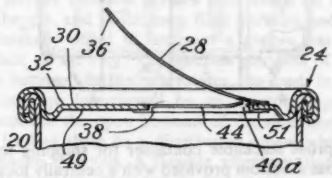
pon ribs formed in appropriate tapering surfaces of the device will engage with the edges about the hole to retain the device within the hole.

3,659,739

EASY-OPEN PULL-TAB CONSTRUCTION FOR A CONTAINER

John Joseph Luviano, Rydal, Pa., and Vinson S. Potts, Cherry Hill, N.J., assignors to Crown Cork & Seal Company, Inc., Philadelphia, Pa.

Filed Nov. 19, 1969, Ser. No. 878,074
Int. Cl. B65d *17/24*
U.S. Cl. 220—53 **17 Claims**



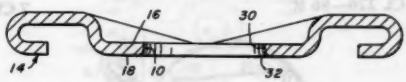
A container end of the easy-opening type including a pull-tab construction comprising a first strip of adhesive tape adhering to and disposed over an opening in the outer surface of the end, and a second strip of adhesive tape adhering to the inner surface of the end and having an at least partially preformed aperture in substantial alignment with the opening.

3,659,740

TAB ELEMENT

Hans H. Diekhoff, Greensburg, and Howard D. Schrecker, Hyde Park, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Mar. 18, 1970, Ser. No. 20,705
Int. Cl. B15d *17/24*
U.S. Cl. 220—54 **4 Claims**



Apparatus for fabricating a tab element having an opening for joinder to a container wall including a female die having an elongated recess and an outwardly disposed annular tab engaging surface. A male die having an upwardly directed boss and a surrounding annular tab supporting surface. The male die having a concave transverse wall connecting the die boss with the annular tab supporting surface. Aligning the tab opening with the die elements and establishing relative clos-

ing movement between the dies produces compressive reforming of the opening defining portion of the tab element to provide a convexly curved portion corresponding in curvature to the male die concave transverse wall.

A method of reforming an opening defining wall in a tab element to provide a continuous wall which diverges from the upper tab surface to the lower tab surface by compressively reforming the continuous wall.

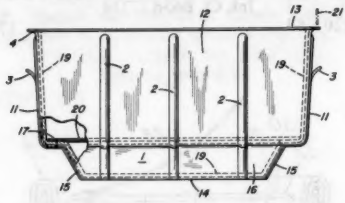
A container wall having a removable sector with a tab element secured thereto by means of an integral rivet including a wall panel having a hollow integral rivet provided with a transverse end wall and a peripheral wall. A tab element having an attachment opening defined by a continuous wall and the rivet extending through the tab element with the continuous opening defining wall in contact with the peripheral rivet wall. The opening defining wall having a lower inwardly convexly curved portion in surface to surface contact with a portion of the peripheral rivet wall having an outwardly concave configuration.

3,659,741

CONTAINERS

Armand Dudley Corelli, 306 Jarvis Street, Toronto, Ontario, Canada

Filed Feb. 20, 1970, Ser. No. 12,991
Int. Cl. B65d *25/14*
U.S. Cl. 220—63 R **10 Claims**



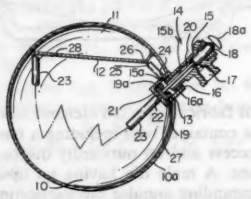
A leak-proof stackable container for shipping ice cooled foodstuff has a bottom provided with a centrally located well. Between the upstanding walls of the container and the upstanding walls of the well there is a peripheral bottom portion uniting these walls and providing support for wooden fillet boxes or perforated plates on which perishable food mixed with ice is deposited. The container is covered with a lid having a centrally located recess of a size to receive the well of a second container stacked thereon. The lid is provided with flanges engaging the upper lip of the container to seal the contents in the container. The lid and container may be insulated with a foamed plastic. Fore greater strength the walls are strengthened with ribs.

3,659,742

LIQUEFIED FUEL GAS CONTAINER

Katuhiro Tagawa, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Yokohama City, Japan

Filed Dec. 22, 1970, Ser. No. 100,601
Claims priority, application Japan, Dec. 30, 1969, 44/105501
Int. Cl. B67c *3/06*
U.S. Cl. 220—86 R **7 Claims**



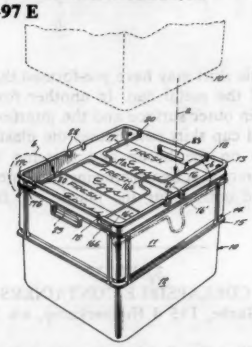
A container for a liquefied fuel gas, constructed to be prevented from being filled with excess liquefied fuel gas which would otherwise lead to unexpected blasting due to thermal expansion of the stored liquefied fuel gas, the container having main and auxiliary compartments which are completely isolated when the liquefied fuel gas is fed into the main compartment and which are permitted to communicate with each other so as to provide an unoccupied space in the main compartment.

3,659,743

PLASTIC NESTING AND STACKING CASE

Theodor Box, 1108 Ailene Road, Brielle, N.J.

Filed July 29, 1970, Ser. No. 59,252
Int. Cl. B65d *21/06*
U.S. Cl. 220—97 E **4 Claims**



A plastic nesting and stacking case in the form of an open-topped integrally molded rectangular unit having a pair of first opposed side walls, a pair of second opposed side walls and a bottom wall, comprises an upper part with its walls normal to said bottom wall, an intermediate part slightly tapering inwardly and having a height equal to a substantial fraction of the height of said upper part, and a lower part having a height equal to said upper part and tapering slightly inwardly towards the bottom wall of the case. The upper edge of the lower part has an outwardly projecting flange, whereby to enable partial nesting of a first case in a second similar case by the flange of the former resting upon the top edge of the latter. A pair of retractible supporting frames rotatively mounted upon the top of the cases serve to enable stacking of a number of cases with the bottom wall of one case resting upon the supporting frames of the case below in the stack.

3,659,744

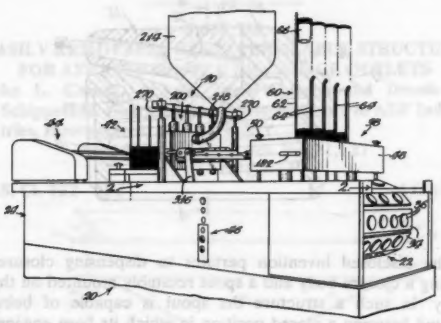
PROCESS AND APPARATUS FOR DISPENSING AND FILLING CONTAINERS

Carl Byrd, Chicago, and Martin Mueller, Glenview, both of Ill., assignors to Owens-Illinois, Inc.

Filed May 18, 1970, Ser. No. 38,245
Int. Cl. B65g *59/00*
U.S. Cl. 221—1 **19 Claims**

A method and apparatus for dispensing containers, and filling the containers with a liquid or semi-solid food product. The container dispensing assembly is adapted to simultaneously dispense the lowermost container from a plurality of stacks of containers in a magazine assembly; and to insure positive dislodgment of the lowermost containers, a stripping plate is positioned above the lowermost containers during the container dispensing step, while lifting plates simultaneously move the containers remaining in the stacks upwardly to positively separate the lowermost containers from the remaining containers. The apparatus includes a conveyor for moving the containers to a filling station, and a suction actu-

ated carrier means positively transports the dispensed lowermost containers to the conveyor and deposits them in a row thereon. A positive displacement piston type pumping means is provided at the container filling station for discharging product into each container in the row, and each pumping means includes a shiftable spool type valve for accurately controlling the amount of product that is dispensed into each



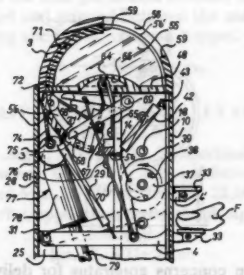
container. The pumping means each include a product dispensing nozzle, and the spool valve is arranged to create a suction on each nozzle during movement of each row of containers to the filling station to prevent dripping and wastage of product. The volumetric output of the pumping means is accurately controlled by a means for adjusting the length of the stroke of the piston means.

3,659,745

MANUALLY OPERATED FOOD PACKAGE DISPENSER WITH AUTOMATIC SLOW DOOR CLOSING

George Striegl, Prescott, and Otto Timm, Spenceville, both of Ontario, Canada, assignors to Otto Timm, Manfried Timm, Irving Richer and Leonard Rabinovitch, trading as Mini Millboard Advertising Regd., Montreal, Quebec, Canada

Filed Apr. 21, 1970, Ser. No. 30,521
Int. Cl. A47f *1/06*
U.S. Cl. 221—12 **6 Claims**



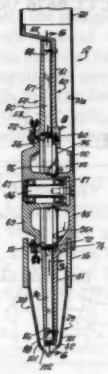
A food package dispenser, more particularly of sugar bags, and for use on restaurant tables. This dispenser forms an open top receptacle for receiving the food packages. A normally closed cover for said receptacle opens upon operation of a lever and closes slowly upon release of the lever to give sufficient time for the operator to move his hand from the lever to the receptacle to grasp a package therein. Automatic closing of the cover keeps the packages in sanitary condition. The dispenser also displays advertising messages which are replaced by other such messages each time the lever is operated to open the cover.

3,659,746

SEED PLANTER

James C. Winslow, 599 Elm Street, Sierra Madre, Calif.

Filed Feb. 9, 1970, Ser. No. 9,824
Int. Cl. A01c *7/04*
U.S. Cl. 221—185 **10 Claims**



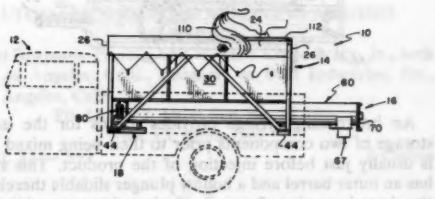
A seed planter for planting seeds in a row at uniform spacing. A rotating seed carrier and ejector ring is provided and has in its interior cylindric surface slots which fill with seed supplied thereto, and which have filler portions and ejection portions laterally offset to intersect a groove cut into the inner surface of the ring. The ejection portions of the slots have open bottoms. As the ring rotates, the seeds in the ejection portions are intercepted by an ejector finger which knocks them out the open bottoms of the slots and through apertures leading them to a distribution wheel which drops them at spaced intervals. A flexible vibratory diaphragm is provided to maintain the seed in free motion, and has an aperture for passing the seeds directly onto the lower portion of the rim of the slotted filler and ejector rim, such that they do not pile too high thereon.

3,659,747

AUTOMATIC FEEDER

James A. Teichgraeber, P.O. Box 632, Emporia, Kans.

Filed Mar. 4, 1970, Ser. No. 16,464
Int. Cl. B67d *5/30*
U.S. Cl. 222—14 **3 Claims**

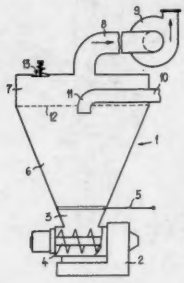


This invention is an automatic feeder mountable on a movable vehicle. It has a frame mounting a hopper, and an auger with a discharge spout extended from the vehicle, and is operable by a control system and powering means. The automatic feeder is mountable on a vehicle, powerable therefrom and operable to deliver automatically a substantially certain amount of material from the hopper.

3,659,748
METHOD AND APPARATUS FOR MAINTAINING CONSTANT THE LEVEL OF FILLING IN A CHARGING CONTAINER ARRANGED BEFORE A CONSUMING DEVICE FOR POURABLE MATERIAL, ESPECIALLY PLASTIC GRANULATE

Erich Beck, Worms-Weinsheim, Germany, assignor to Ingenieurbureau Dr. Brehm AG, Zurich, Switzerland

Filed Jan. 26, 1970, Ser. No. 5,457
Int. Cl. B67d *5/08*
U.S. Cl. 222—56 **14 Claims**

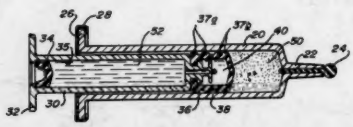


There is disclosed an apparatus and method for maintaining substantially constant the level of filling of pourable material, especially plastic granulate, into a charging container arranged in front of a consuming device. Thus, there is provided a charging container having at its top region a suction pipe directed away from the charging container and therebelow a conveying conduit entering into said charging container. Operatively communicating with the suction pipe and the conveying conduit is a blower or suction device. The suction conveying installation is operated at a feeding capacity which is above the material requirements of the consuming device, and the pressure at the inlet region of the consuming device is maintained such that it does not exceed the pressure in the charging container.

3,659,749
INTERMIXING SYRINGE

Boris Schwartz, 400 Park Avenue, Paterson, N.J.

Filed Apr. 28, 1970, Ser. No. 32,695
Int. Cl. B67d *5/12*
U.S. Cl. 222—145 **13 Claims**

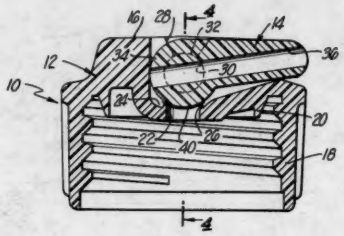


An intermixing syringe provides means for the isolated storage of two components prior to their being mixed which is usually just before injection of the product. This syringe has an outer barrel and a hollow plunger slidable therein with the barrel portion forward of the piston providing one chamber and the plunger providing the other chamber. The plunger is provided with a piston having spaced, ring-like sealing surfaces and a fluid passageway extending from the interior of the plunger to the outer piston surface. The barrel of this syringe is formed with a straight-bored inner surface and includes no undercuts. The forward most sealing surfaces or end of the plunger piston is disposed to be moved from a sealing condition into a fluid flow or conducting condition to permit flow into the forward portion of the barrel.

3,659,750
DISPENSING CLOSURE WITH BONDED SPOUT SEAL

Donald H. La Vange, Uxbridge, Mass., assignor to Polytop Corporation, Slatersville, R.I.

Filed June 22, 1970, Ser. No. 48,094
Int. Cl. B65d *47/10*
U.S. Cl. 222—153 **6 Claims**

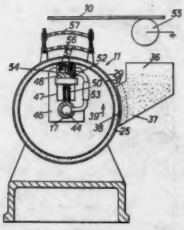


The disclosed invention pertains to dispensing closures having a closure body and a spout rotatably mounted on the body. In such a structure the spout is capable of being rotated between a closed position in which its base engages the closure body around an opening leading through the body so as to close off the opening and an open position in which a passage leading through the spout is aligned with the opening in the closure body. In a closure as disclosed a physical bond or seal connects the base of the spout and the closure body around the opening when the spout is in an initial closed position. When the spout is first moved to an open position this bond or seal is disrupted or broken.

3,659,751
APPARATUS FOR DELIVERING METERED QUANTITIES OF POWDERED MATERIAL TOWARDS A POINT OF USE

Albert Edward Jackson, Givernaffield Mold, Wendover, and Robert Gordon Russell, 72 Nont Parc, Prestatyn, both of England

Original application Dec. 11, 1968, Ser. No. 782,897. Divided and this application July 15, 1970, Ser. No. 55,077
Int. Cl. B05b *5/00*
U.S. Cl. 222—194 **9 Claims**



The invention concerns apparatus for delivering metered quantities of powdered material towards a point of use, the said apparatus comprising a rotor having an outer perforated shell whose perforations are adapted to receive the powdered material, the rotor also having an inner perforated shell which is mounted within the outer perforated shell, means comprising a porous filling which spaces the inner shell from the outer shell, the said means closely contacting the outer perforated shell, powder supply means arranged to supply the powdered material as the rotor rotates to the perforations in successive portions of the outer perforated shell, and a fluid conduit which is disposed within the inner perforated shell and which is, at any moment, sealed to a portion thereof

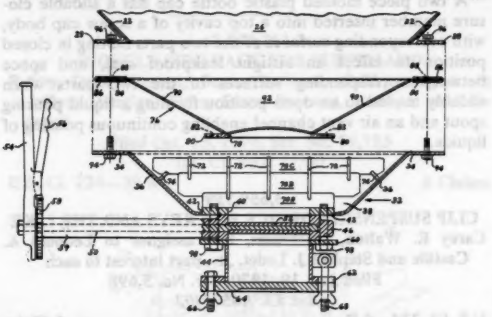
which is angularly spaced from the portion of the outer perforated shell which is being supplied with powdered material from the powder supply means, means to supply the fluid conduit with a fluid which will pass through the inner perforated shell and the porous filling, the powdered material being ejected from the perforations in the outer perforated shell and delivered in metered quantities towards the point of use.

3,659,752

EASILY REMOVABLE FLUID PERMEABLE STRUCTURE FOR AERATED HOPPER DISCHARGE OUTLETS

John L. Carney, Jr., St. Louis County, and Dennis J. Schipper, St. Charles, both of Mo., assignors to ADF Industries, Incorporated, New York, N.Y.

Filed Mar. 19, 1970, Ser. No. 21,127
Int. Cl. B65g 3/12
U.S. Cl. 222—195 4 Claims



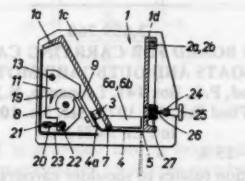
A fluid permeable member for an aerated hopper discharge outlet which may be easily inserted within and removed from the hopper discharge outlet. The fluid permeable member comprises a one-piece inner insert having a central discharge opening in vertical alignment with the discharge opening of the bottom discharge outlet and is easily secured in spaced relation to the outer lower housing or body of the discharge outlet by releasable securing means, such as threaded bolts. The inner fluid permeable insert is preferably formed of a stainless steel wire mesh material. The outer housing of the discharge outlet has an upper peripheral flange mating with a lower peripheral flange on the bottom of the hopper, and the fluid permeable member has a peripheral flange positioned and gripped between the mating flanges of the outer housing and the superjacent hopper.

3,659,753

STREWING APPARATUS, ESPECIALLY FOR BAKING INSTALLATIONS

Hans-Joachim Jager, Burgdorf, Switzerland, assignor to Gustave A. Seewer, Burgdorf Canton of Berne, Switzerland

Filed Mar. 25, 1970, Ser. No. 22,604
Claims priority, application Switzerland, Apr. 9, 1969, 5363/69
Int. Cl. A21c 1/00
U.S. Cl. 222—199 7 Claims



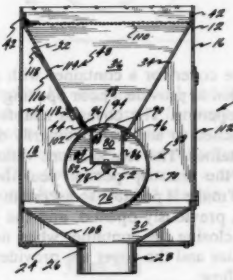
A strewing apparatus, especially for baking installations, which is of the type embodying a container for the material to be scattered or strewn which possesses a cross-sectional configuration which narrows towards the bottom end thereof, said container incorporating a forward wall and a rearward wall. A base plate which serves to close the major portion of the lower opening of the container is mounted via oscillating support elements to the rear wall of the container. An oscillating or vibration drive mechanism disposed behind the rear container wall serves to place the base plate into oscillatory movement. As a result of this oscillatory or vibratory motion imparted to the base plate, the marginal edge thereof which, together with the forward wall of the container forms a throughpassage slit for the material to be strewn, is primarily moved up and down, whereby the upward movement, at least at the start thereof, occurs in jerky fashion. Furthermore, additional means are provided for independently adjusting the basic width of the aforementioned throughpassage slot or slit.

3,659,754

PELLETIZED ANIMAL FEED DISPENSER

Michael Barone, 10250 West 78th Avenue, Arvada, Colo., and Frank Barone, Jr., 2561 South Wolff, Denver, Colo.

Filed May 11, 1970, Ser. No. 36,337
Int. Cl. G01f 11/00
U.S. Cl. 222—368 2 Claims



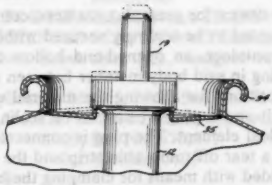
This invention relates to a dispenser for pelletized animal feeds characterized by an overhead open-topped feed storage hopper opening into a hollow cylindrical bucket mounted for rotation about a horizontal axis above a discharge chute. The bucket has an elongate inlet opening in the top thereof having an inclined trailing edge that cooperates with an adjacent edge of the hopper wall to produce a scissor-like shearing action adapted to easily cut through any pellets trapped therebetween. The lower edge of the opposite hopper wall bordering the bucket is foreshortened to provide a gap which is bridged by a brush wiper.

3,659,755

AUTOMATIC PRESSURE RELIEVING AEROSOL PRODUCT

Samuel Benjamin Prussin, and Howard Clyde Tracy, Jr., both of Los Angeles, Calif., assignors to Dart Industries, Inc., Los Angeles, Calif.

Filed Mar. 2, 1970, Ser. No. 15,480
Int. Cl. B05b 3/00
U.S. Cl. 222—397 5 Claims



An automatic pressure relieving aerosol product and container having an actuator member held fixedly against out-

ward movement with respect to the can, and a valve carrying member that will move the valve stem against the actuator in response to excess pressure. When such pressure is present in the can, the valve carrying member moves upwardly whereupon the valve is opened thereby relieving the pressure. The actuator is of the type that will normally be moved with hand pressure to open the valve, thereby permitting the aerosol container to be operated in the usual manner under normal conditions.

3,659,756

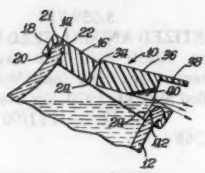
CONTAINER COVER

John Kenneth Lancaster, 630 Eagle Lane, Palatine, Ill.

Filed June 24, 1969, Ser. No. 836,090

Int. Cl. B65d *47/08, 47/10*

U.S. Cl. 222—531 **7 Claims**



A one piece cover for a container with a hand actuatable tearstrip portion to provide a pour opening and to form a closure for the opening. The cover is adapted to be semi-permanently attached to and thus ordinarily difficult to remove from the container. The tear sections which define the pour opening and the tearstrip portion seal the contents of the container and make it possible to ascertain that the container had not been previously opened, and the closure forms the means for re-closing the container when not in use. In addition, the closure and the cover are provided with a spout for dripless pour flow.

3,659,757

CLOSURE DEVICE FOR GENERAL CONTAINERS

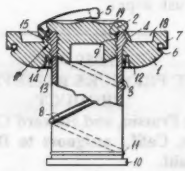
Francesco Tini, Via Lambro 82/84, Rozzano-Quinto Stampi, Italy

Filed Apr. 15, 1970, Ser. No. 28,619

Claims priority, application Italy, Apr. 23, 1969, 15933 A/69

Int. Cl. B65d *47/10;* **B67d** *3/00*

U.S. Cl. 222—541 **7 Claims**



A closure device for general containers, comprising a body member adapted to be sealingly secured within a performed bore of a container, an opened-end hollow cylindrical element screwing in said body member between re-entered and extracted positions for allowing the material within the container to exit and a plug which can be sealingly screwed in said cylindrical element. The plug is connected to said body member by a tear off removable strip and the closure device is also provided with means for clamping the hollow cylindrical element at its extracted position and means for preventing said cylindrical element from completely exiting.

3,659,758

SLIDING TOP INTERNAL POURER BOTTLE CAP

Neil S. Waterman, Stamford, Conn., assignor to Atlantic Design & Development Corporation, Stamford, Conn.

Filed Dec. 10, 1969, Ser. No. 883,811

Int. Cl. B65d *47/20*

U.S. Cl. 222—561 **1 Claim**

A two piece molded plastic bottle cap has a slidable closure member inserted into a top cavity of a screw cap body, with corresponding surfaces of the two parts mating in closed position to effect an airtight leakproof seal, and space between corresponding surfaces of the two parts when slidably moved to an open position forming a liquid pouring spout and an air vent channel enabling continuous pouring of liquids.

3,659,759

CLIP SUSPENSION DEVICE FOR KEYS AND THE LIKE

Carey E. Walton, Opelousas, La., assignor to Leopold A. Castille and Stephen J. Ledet, Jr., part interest to each

Filed Jan. 19, 1970, Ser. No. 3,698

Int. Cl. A45f *5/02*

U.S. Cl. 224—5 R **1 Claim**

A clip for keys, "pocket" watches and the like for suspending the items from the waist band of an article of clothing on the inside of the article of clothing out of sight between it and the human body in a particular region of the human anatomy, viz. at or near the boundary between the iliac and the hypogastric regions of the lower abdomen directly between the anterior superior iliac spines wherein the body forms a natural, elongated hollow. Such positioning prevents any discomfort to the user and creates no unsightly bulge. The lower extension (5) of the clip angles down and away from the plane of the clip portion (2,4) and assists the natural contours of the human body in positioning the items in the desired location.

3,659,760

SLING AND BOARD FOR CARRYING CANOES, SMALL BOATS AND OUTBOARD MOTORS

Lewis H. Blood, P.O. Box 141, Leonardo, N.J.

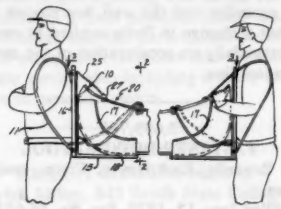
Filed Feb. 11, 1970, Ser. No. 10,561

Int. Cl. A45f *3/00*

U.S. Cl. 224—25 A **5 Claims**

This invention relates to shoulder carriers or slings and to a type that is adapted for the transport particularly of canoes, small boats or outboard motors. It involves shoulder straps in

the form of loops, connected at both ends, and a board in which the straps are attached and adjustable and said board



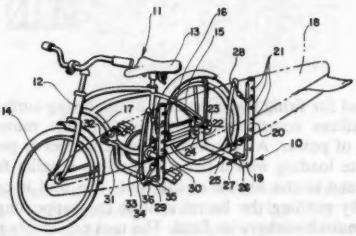
provided with means to hold a boat, canoe or outboard motor.

3,659,761

BICYCLE SIDE RACK FOR SURFBOARD

Bobby Dean Wesson, Santa Barbara, Calif., assignor to Jeffrey Douglas White, Santa Barbara, Calif., a part interest

Filed Oct. 13, 1970, Ser. No. 79,723
Int. Cl. B62j *11/00*
U.S. Cl. 224—39 R **6 Claims**



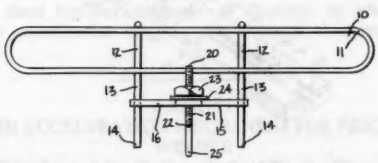
A surfboard carrier rack has fore and aft brackets extending from one side of a bicycle. The brackets coact with corresponding adjustable braces which are looped at least partially around the surfboard forward and rearward sections to resiliently suspend the surfboard while holding it generally in a vertical plane.

3,659,762

BICYCLE WHEEL CARRIER FOR AUTOMOBILE MOUNTING

Harley A. Kravitz, Pepper Pike, Ohio, assignor to Acar Industries, Inc., Willoughby, Ohio

Filed Nov. 12, 1970, Ser. No. 88,827
Int. Cl. B62d *43/00*
U.S. Cl. 224—42.03 B **11 Claims**



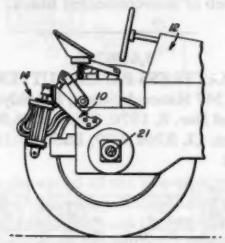
A wheel well is provided having horizontally extending spaced arms inter-connected by a cross-member. An adjustable length swivel hook element is secured to the cross-member and is adapted to engage either the upper edge of the rear bumper of the automobile or the lip of the trunk opening. Tightening of the hook element draws the spaced arms forwardly into engaging abutment with another portion of the rear of the automobile, such as the bumper surface, a body panel or the lip of the trunk lid opening. A pair of such wheel wells are mounted on the rear of an automobile and serve in combination as a bicycle or cycle carrier for convenient transport of such two-wheeled vehicles.

3,659,763

HYDRAULIC CYLINDER SUPPORT FOR TRACTORS

Doyle A. Johnson, R.R. 3 Box 52, Paulding, Ohio

Filed June 29, 1970, Ser. No. 50,865
Int. Cl. B60r *9/06*
U.S. Cl. 224—42.45 R **2 Claims**



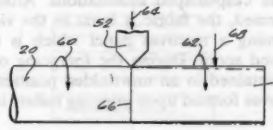
An inclined bracket having a hooked end is secured to a tractor chassis and provides a means for supporting an auxiliary hydraulic motor during periods when the motor is not in use. The bracket includes an abutment which engages the hydraulic motor. This abutment serves as a mechanical stop restraining the motor from unwanted motion when the tractor is moving.

3,659,764

METHOD AND APPARATUS FOR SEVERING CYLINDRICAL STOCK

Kasimir Janiszewski, 5426 W. Andover Road, Milwaukee, Wis.

Filed Mar. 16, 1970, Ser. No. 19,918
Int. Cl. B26f *3/00*
U.S. Cl. 225—2 **5 Claims**



The bar or tube stock to be severed is peripherally scored and rotated while deflecting the length to be severed and thereby angling its axis to that of the unsevered stock, the angle between the axes having its apex in the plane of the scoring.

3,659,765

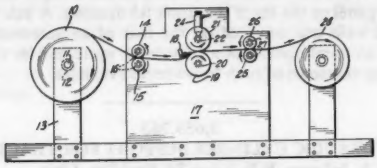
METHOD FOR FIBRILLATING A TRANSVERSELY ORIENTED PLASTIC MATERIAL

Frank Kalwaites, Somerville, N.J., assignor to Johnson & Johnson

Original application Mar. 5, 1968, Ser. No. 710,611, now Patent No. 3,515,325. Divided and this application Aug. 11, 1969, Ser. No. 870,877
Int. Cl. B26f *3/02*
U.S. Cl. 225—4 **1 Claim**

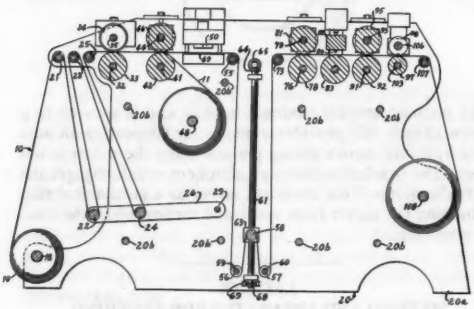
Method for fibrillating transversely oriented plastic material by moving the material in the direction of its length at a

given speed and instantaneously and simultaneously applying compressive forces and longitudinal forces to the material



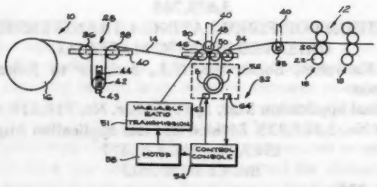
while maintaining the speed at which it is moving to split the material into a web of interconnected fibers.

3,659,766
MATTRESS PANEL CUTTER
Edward Alago, 1347 Hancock Street, Brooklyn, N.Y.
Filed Dec. 8, 1970, Ser. No. 96,021
Int. Cl. B26d *9/00*; B65h *35/10*
U.S. Cl. 225—94 **3 Claims**



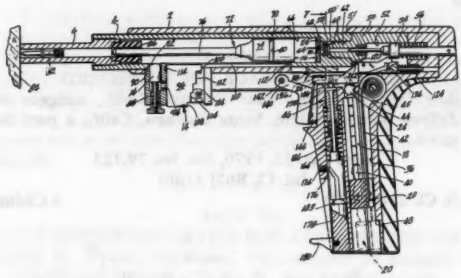
A spool of fabric is fed through a series of rollers where it is exposed to cutters which trim it to a predetermined width, shear cusp-shaped indentations at regular intervals on opposing edges of the fabric and form perforations between the apices of the cusp-shaped indentations. After the perforations are formed, the fabric is burst in the vicinity thereof, thereby forming a mattress panel which is then disposed upon a second spool. During the foregoing operations, the fabric is maintained in an unwrinkled position by means of angular grooves formed upon gripping rollers in contact with the fabric.

3,659,767
TENSION REGULATION APPARATUS
John R. Martin, 2516 Harlem Boulevard, Rockford, Ill.
Filed Dec. 29, 1969, Ser. No. 888,588
Int. Cl. B65h *23/18*
U.S. Cl. 226—195 **9 Claims**



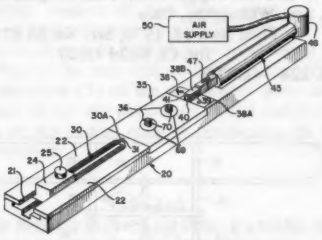
Apparatus for preventing a change in the tension in one region of a moving web from causing a change in the tension in another region of the web. An assembly which is movable translationally and rotationally by a force applied by a change in web tension at one of two engagement lines between the assembly and the web, has masses which are so distributed that a change in force applied at one of the lines produces substantially no acceleration of the assembly at the other engagement line.

3,659,768
FASTENER DRIVING TOOL
Lawrence J. Brunelle, East Haven, Conn., assignor to Olin Corporation
Filed June 12, 1970, Ser. No. 45,651
Int. Cl. B25c *1/14*
U.S. Cl. 227—10 **23 Claims**



A tool for firing fasteners into a supporting surface, which tool utilizes compacted pellets of ignitable material as a source of power. A compound firing chamber is provided to facilitate loading with a pellet magazine, a pellet feed being positioned in the handle of the tool. The tool is cocked for firing by pushing the barrel against the supporting surface, and cannot be otherwise fired. The tool preferably includes a fastener-driving member in the form of a piston and the piston can be automatically returned to a plurality of driving or firing positions to vary the power of the tool for a given propellant load.

3,659,769
FASTENER ATTACHMENT SYSTEMS
Arnold R. Bone, Needham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.
Filed Apr. 17, 1970, Ser. No. 29,564
Int. Cl. B65c *7/00*
U.S. Cl. 227—68 **23 Claims**



A machine for inserting an attachment member having a filament and heads on either end through an opening in an article, said machine including a holder for the article, a tube for receiving a head of the attachment member, a device for feeding the attachment member into an end of the tube, said tube adapted to first enter the opening in the article, then

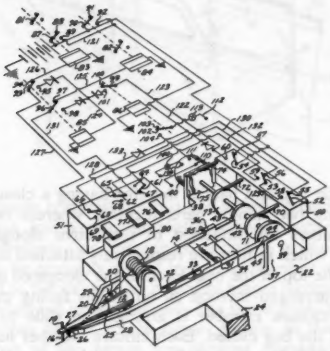
proceed to pick up the attachment member from device for feeding an then carry a portion of the attachment member back through the article opening. The device for feeding the attachments includes a fluid powered piston shaped to feed attachment members into the device, said piston carrying a rod to push the attachment members into the tube, needle or the like and the device also including a valve to cause fluid under pressure to move the piston.

3,659,770

CIRCUIT BONDING MEANS

Charles Fredrick Miller, 843 South State College Boulevard, Anaheim, Calif.

Filed Dec. 13, 1968, Ser. No. 783,571
Int. Cl. B23k *1/06, 5/20*
U.S. Cl. 228—1 **8 Claims**



This disclosure relates to improvements in methods and in means for accomplishing electrical wiring. The method makes use of a bonding tool which is capable of furnishing energy sufficient to bond a conductor to a circuit point. The conductor is positioned over that point in the line of action of the tool. Bonding energy is applied to complete the bond. The standing part of the conductor is grasped at a point along its length adjacent to but removed from the bond and it is pulled sufficiently to break the conductor adjacent the bond. Grasp of the conductor is maintained and its broken end is then positioned to lie in the line of action of the bonding tool so that the two can be moved together to another circuit point. Advantageously, these are made the end steps, those applicable to completion of a second bond, in a process which includes additional steps by which a first bond is completed. The means envisioned by the disclosure includes a bonding tool and a clamp mounted for movement with the bonding tool but capable of independent movement so that it can break the standing part of a length of conductor wire after completion of a circuit run and so that it can position the broken end properly to initiate another circuit run. In addition to the bonding tool and the clamp and the means to move them together, apparatus is disclosed by which the proper coordination between these several elements is assured.

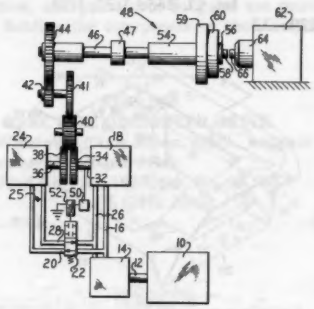
3,659,771

RAPID ACCELERATION MECHANISM FOR FRICTION WELDER

Jozef Kiwalle, and Ira H. Sage, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 2, 1970, Ser. No. 85,854
Int. Cl. B23k *27/00*
U.S. Cl. 228—2 **4 Claims**

A rapid acceleration mechanism is provided for a friction welder having a fixed displacement fluid pump. The pump is operatively interconnected with the two fluid motors so that both motors drive the welder spindle during the early portion of the acceleration cycle and only one of the motors drives



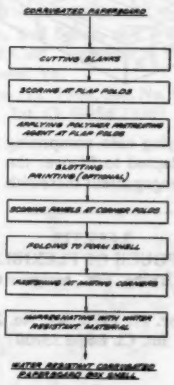
the spindle after the speed of the two motors approaches the maximum output of the pump. Replaceable change gears are provided for the drive train of the welder to provide acceleration and total speed flexibility for the drive system.

3,659,772

WATER RESISTANT CORRUGATED ARTICLES HAVING IMPROVED FOLD FLEXIBILITY

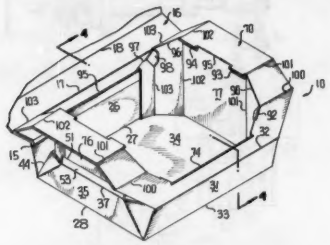
William Smith Dorsey, Fullerton; Thomas Hallis, Jr., Brea, and Edward A. Pullen, Fullerton, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Original application Apr. 4, 1966, Ser. No. 539,749, now Patent No. 3,529,516, dated Sept. 22, 1970. Divided and this application June 5, 1970, Ser. No. 43,829
Int. Cl. B65d *25/14*
U.S. Cl. 229—3.1 **10 Claims**


CORRUGATED PAPERBOARD
CUTTING BLANKS
SCORING AT FLAP FOLDS
APPLYING POLYMER PRETREATING AGENT AT FLAP FOLDS
SLOTTING PRINTING (OPTIONAL)
SCORING PANELS AT CORNER FOLDS
FOLDING TO FORM SHELL
IMPREGNATION WITH WATER RESISTANT MATERIAL
WATER RESISTANT CORRUGATED PAPERBOARD BOX SHELL

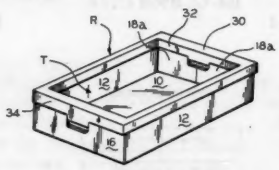
A method for forming a flexible fold in corrugated paperboard rendered water resistant by impregnation with a solidifiable water proofing agent that imparts rigidity to the paperboard in which the fold is first treated with a non-rigid polymer pretreating agent prior to impregnation and a water resistant corrugated article having folds rendered flexible by this method. The method is particularly useful in manufacturing water resistant corrugated paperboard boxes having improved fold flexibility.

3,659,773
CARTON
Guelfo A. Manizza, Blauvelt, N.Y., assignor to Continental Can Company, Inc., New York, N.Y.
Filed Nov. 13, 1970, Ser. No. 89,201
Int. Cl. B65d 5/22, 5/36
U.S. Cl. 229—33 12 Claims



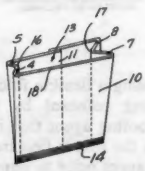
This disclosure relates to an improvement in a collapsible and erectable carton of the type having at opposite ends a depending end wall inboard and adjacent an upstanding end wall, and means between adjacent upstanding and depending end walls for automatically moving the upstanding end wall from a flat collapsed condition to its upstanding condition by moving the depending end walls from like generally flat collapsed conditions to the depending conditions thereof. The automatic means includes a hingeable panel joined between each adjacent pair of upstanding and depending end walls.

3,659,774
COMPOSITE CARRYING CASE
Robert H. Mielke, Chicago, Ill., assignor to Container Corporation of America, Chicago, Ill.
Filed Aug. 7, 1970, Ser. No. 61,979
Int. Cl. B65d 5/46, 15/12
U.S. Cl. 229—52 B 2 Claims



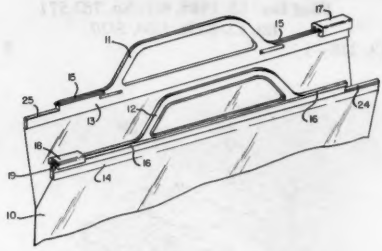
A composite carrying case comprising a paperboard tray and a plastic rim adapted to fit over the upper edge of the tray in interlocking engagement therewith.

3,659,775
UPSTANDING POUCH OF FLEXIBLE MATERIAL
George W. Truman, Irving, Tex., assignor to Dixico, Inc., Dallas, Tex.
Filed Apr. 17, 1970, Ser. No. 29,386
Int. Cl. B65d 33/00
U.S. Cl. 229—53 7 Claims



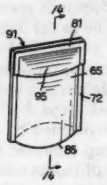
A pouch of one-piece of flexible material having two side gussets of different dimensions and end seals perpendicular to said gussets, one of which end seals in closed before the filling of the pouch and the other end seal being closed thereafter providing a pouch which will stand upright without support using the larger gusset as the base therefore and a method of making such a pouch from web material.

3,659,776
BAG HANDLE
Heikki S. Suominen, Vihmainen, Tampere, Finland
Filed Oct. 19, 1970, Ser. No. 81,796
Int. Cl. B65d 33/06, 33/16
U.S. Cl. 229—54 R 9 Claims



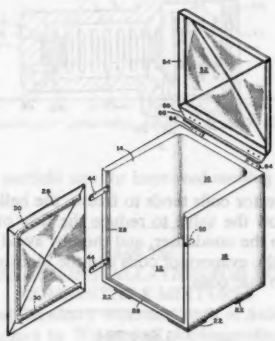
A plastic bag and handle therefor having a closure means for holding two handle parts together wherein two handle grip members are attached to respective elongated strip members which in turn are respectively attached to opposite sides of the top of the bag. Each of the elongated strip members has arranged thereon an outwardly facing track along which a closure member is arranged to slide to hold the mouth of the bag closed. Each closure member has internal walls which define grooves through which the tracks pass.

3,659,777
REINFORCED PACKAGE
Takashi Kanada, No. 28 Shinsaku 1 Chome, and Toshio Tanaka, No. 128 Yotsuyakamichi, both of Kawasaki-shi, Kanagawa-ken, Japan
Filed June 30, 1969, Ser. No. 837,728
Int. Cl. B65d 33/02, 75/58
U.S. Cl. 229—55 5 Claims



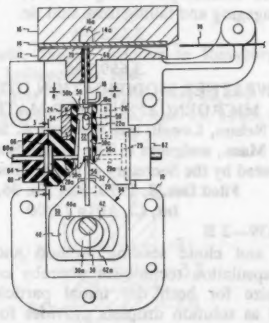
An apparatus for continuously forming packages. Each package comprises a pocket and a flexible container therein with packaged material in the container. An endless tube of flexible material is formed from a continuous web at a tube forming station. Opposed areas of the tube are secured together in a sealing station to form a pouch with the opening of the pouch in the tube forming station. The pouch is supplied with a measured amount of packaging material and is moved through the sealing station to form a bottom for a successive pouch. The closed containers are divided into separate segments and are separated in a pair of cutting stations. A pocket like container is formed around the containers at the sealing and dividing stations. A protective antiseptic film may be marginally secured on each outer side of the pocket at its closed end.

3,659,778
RECEPTACLE
Robert H. Saultz, Pompano Beach, and Julius A. Crane, Oakland Park, both of Fla., assignors to Atlantic Coast Precast, Inc., Ft. Lauderdale, Fla.
Filed July 20, 1970, Ser. No. 56,472
Int. Cl. B65d 91/00
U.S. Cl. 232—43.1 4 Claims



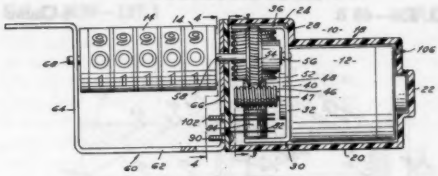
A receptacle comprising a box-like structure having a bottom portion and a circumferential sidewall extending upwardly therefrom; an opening is provided in the sidewall adapted to be normally closed by a door member and which is attached to the sidewall by means of hinges having portions thereof embedded in the sidewall. The top is provided with a cover member hinged to the upper portion of the sidewall and sections of the hinges are likewise embedded in the sidewall; the cover has a circumferential flange which overlies the upper edges of the sidewall and of the door when the door and the cover are in a closed position to seal the receptacle to protect the contents of the receptacle. The door member and the cover member of the receptacle are made of a lightweight material dissimilar from the relatively heavier material of which the body of the receptace is made.

3,659,779
PUNCH MECHANISM
John W. Berkman, Oronoco, and Lawrence R. Gravell, Rochester, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 26, 1970, Ser. No. 22,961
Int. Cl. G06k 1/02
U.S. Cl. 234—114 14 Claims



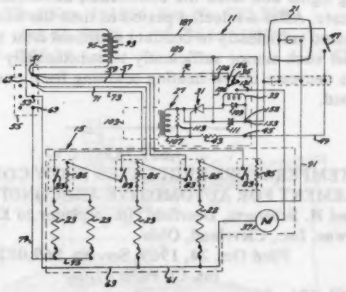
A punch mechanism including a line of punches each having an interposer disposed between it and reciprocating drive mechanism. The interposers are reciprocably disposed in slots in a guide block, being pivoted therein by virtue of end walls of the slots acting on the edges of the interposers. A pneumatic piston is provided for moving each of the interposers into alignment with the drive mechanism to cause a punching action, and permanent magnets are provided for moving and holding the interposers in their inactive positions.

3,659,780
ELECTRIC ODOMETER DRIVE
Gary Floyd Woodward, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Nov. 30, 1970, Ser. No. 93,598
Int. Cl. G01c 22/00
U.S. Cl. 235—95 R 5 Claims



An electrically operated odometer including an electric motor, a plurality of odometer rolls and reduction gearing preferably in the form of series connected worm and worm gear sets coupling the electric motor to the odometer rolls. A plastic housing completely encloses the electric motor and the reduction gears with the housing being positioned in spaced relationship to the electric motor. The electric motor is alternately energized and de-energized by suitable switching arrangements to drive the odometer rolls, and the reduction gearing provides high torque and minimum overrun on the odometer rolls.

3,659,781
MONITORING APPARATUS HAVING AUXILIARY SWITCHING MEANS
Marvin M. Graham, Seal Beach, and William W. Chambers, Anaheim, both of Calif., assignors to Robertshaw Controls Company, Richmond, Va.
Filed Nov. 12, 1969, Ser. No. 875,977
Int. Cl. G05d 23/00
U.S. Cl. 236—11 8 Claims



Monitoring apparatus for controlling a circulating means which circulates a fluid in heat exchange relationship with a temperature change unit. Condition sensing means is provided for actuating the temperature change unit when a predetermined condition is sensed. Monitoring means includes a housing which mounts a current sensing means

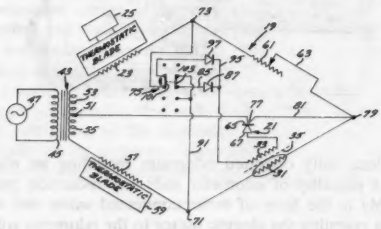
which is responsive to current flow in the temperature change unit to produce an electrical signal. An automatic actuator is mounted in the housing and is connected in circuit with the current sensing means and is responsive to such electrical signal to actuate the circulating means. An auxiliary actuator is connected in circuit with the automatic actuator and is actuable to produce an electric signal to actuate the circulating means independently of the temperature change unit whereby the circulating means can be actuated by the auxiliary actuator independently of the temperature change unit.

3,659,782

LATCH-ON TEMPERATURE CONTROL SYSTEM

William W. Chambers, Anaheim, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 19, 1970, Ser. No. 65,218
Int. Cl. G05d *23/24*
U.S. Cl. 236—68 B **6 Claims**



A latch-on temperature control system including a load for operating a heating unit to heat a media. A gate controlled conduction device is provided for controlling current flow through the load. A sensor is provided for sensing the temperature of the media and is connected in circuit with the load and with the gate of the conduction device. A feedback heater is connected in circuit with the conduction device and is disposed in heat exchange relationship with the sensor. A mechanical heat shield is interposed between the sensor and the feedback heater for delaying heat transfer from the heater to the sensor whereby when the temperature of the media drops below a predetermined temperature a triggering signal will be imposed on the gate of the conduction device to initiate current flow through the load and through the feedback heater thereby actuating the heating unit and, concurrently, decreasing the rate of current flow in the sensor resulting in a decrease in its self-heating to enhance the triggering signal and latch the conduction device in its conductive state. After a selected period of time the heat shield will be heated sufficiently to conduct sufficient heat to the sensor to heat such sensor sufficiently to substantially compensate for its decrease in self-heating resulting from energization of the load.

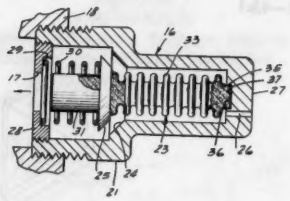
3,659,783

TEMPERATURE REGULATED FLOW CONTROL ELEMENT FOR AUTOMOTIVE AIR-CONDITIONERS

Samuel H. Schwartz, Deerfield, Ill., assignor to Eaton Yale & Towne, Inc., Cleveland, Ohio

Filed Oct. 24, 1969, Ser. No. 869,052
Int. Cl. F25b *41/04*
U.S. Cl. 236—93 **1 Claim**

Thermally responsive control element in the suction side of the compressor of an air-conditioning system. The control element is in the form of a housing having an integral valve seat formed on the inner wall. A poppet valve is carried by the cup of a thermally responsive element, and is biased into engagement with the seat by a spring. A bellows forms a continuation of the cup and has communication therewith, and with the cup contains a fusible thermally responsive material. The bellows is closed at its outer end and has abutting engagement with the end of the housing. As the temperature of the evaporator reaches a point that condensed water vapor



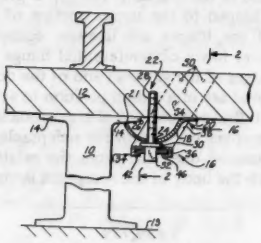
on the evaporator coils tends to freeze, the bellows will contract and allow the valve to reduce the flow of as from the evaporator to the condenser, and thereby avoid uncontrolled freeze-up of the evaporator coils and the blocking of the flow of air through said coils.

3,659,784

CLAMPING STRUCTURE FOR ELEVATED RAILROAD TIES

Lawrence Klosk, 120 Gale Place, Bronx, N.Y.

Filed Jan. 26, 1970, Ser. No. 5,596
Int. Cl. E01d *19/12*; E01b *9/66*
U.S. Cl. 238—349 **22 Claims**



A bracket for use with a clamp and screw spike adapted to clamp elevated railroad ties to a support structure comprises a U-shaped member having a base portion and vertically extending wing portions. The base portion is provided with an elongated slot and a washer received therein for registering with the nut-shaped head portion of the screw spike. The vertically extending wing portions are adapted to be secured to the tie, the bracket preventing the screw spike and clamp from disengaging and falling from said tie.

3,659,785

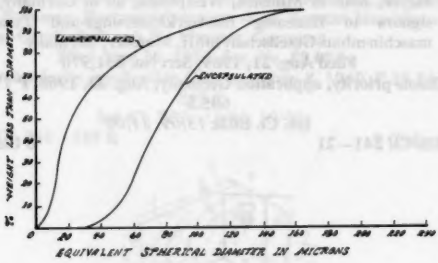
WEATHER MODIFICATION UTILIZING MICROENCAPSULATED MATERIAL

Loren D. Nelson, Lowell, and Bernard A. Silverman, Natick, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force

Filed Dec. 8, 1970, Ser. No. 96,147
Int. Cl. A01g *15/00*
U.S. Cl. 239—2 R **4 Claims**

A fog and cloud seeding method and agent utilizing microencapsulation techniques whereby controlled seeding particle size for both dry initial particles and particles dispensed as solution droplets provides for the production and maintenance of a predetermined particle spectrum when using hygroscopic chemical compounds which are fragile, brittle or friable in crystalline structure. A hygroscopic

chemical agent to be utilized in cloud or fog seeding is provided with a liquid permeable capsule shell such that optimization of particle size for improved seeding results is obtained.

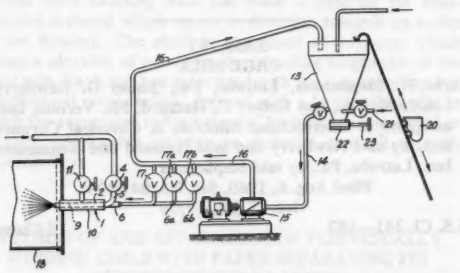


3,659,786

PROCESS AND INSTALLATION FOR BURNING COMBUSTIBLE MIXTURES

Fritz Vier, and Bernhard Winkeler, both of Salzbergen, Germany, assignors to Wintershall Aktiengesellschaft, Kassel, Germany

Filed Dec. 23, 1970, Ser. No. 100,968
Int. Cl. F02d *1/06*
U.S. Cl. 239—5 **10 Claims**



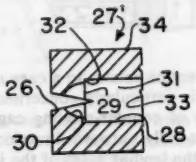
A process and burner installation for burning combustible waste product sludges containing solid particulate contaminants, including a nozzle chamber adapted to mix the waste sludge with pressurized air. The static air pressure in the nozzle chamber is maintained at a predetermined pressure head in order to regulate the inlet of sludge to the chamber, so as to thereby effect control over the ratio of sludge to air in the mixture formed for burning.

3,659,787

NOZZLE

Siro Ito, Kawasaki, Japan, assignor to Ransburg Electro-Coating Corp., Indianapolis, Ind.

Filed Mar. 25, 1970, Ser. No. 22,492
Claims priority, application Japan, Apr. 16, 1969, 44/29575
Int. Cl. B05b *5/00*
U.S. Cl. 239—15 **15 Claims**



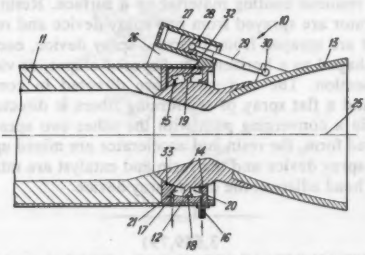
A spray nozzle for an apparatus which hydraulically atomizes and sprays coating material. The spray nozzle includes a body and a passageway in the body. A forward portion of the passageway has converging side walls. An opening, formed in the body, communicates with the passageway to provide an orifice for the coating material. A step is provided in the passageway. The passageway, the opening and the step in the passageway of the nozzle cooperate to provide a pattern of deposited coating material having feathered edges.

3,659,788

JET NOZZLE ASSEMBLY

Harry Oldfield, Coventry; Gordon Terry Healey, Staverton, Nr. Daventry, and John Anthony Ridgway, Hinckley, all of England, assignors to Rolls-Royce Limited, Derby, England

Filed Oct. 14, 1970, Ser. No. 80,738
Claims priority, application Great Britain, Oct. 23, 1969, 52,044/69
Int. Cl. B64d *33/04*; B64c *15/04*
U.S. Cl. 239—127.1 **10 Claims**



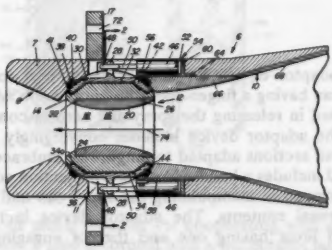
A jet nozzle assembly comprises a housing having a curved bearing surface which provides a seating for a complementary surface of a universally swivellable nozzle member through which in operation a propulsive jet may flow, an actuator for causing swivelling of the nozzle member relative to the housing, a conduit for supplying a cooling and/or lubricating fluid to the surfaces, a flange member secured to the nozzle member, and pressure responsive assembly for applying, in operation, hydrostatic pressure to the flange member so as to reduce or eliminate frictional opposition to its swivelling movement due to said propulsive jet.

3,659,789

THRUST NOZZLE FOR ROCKETS

Stephen D. Schultz, Brigham City, Utah, assignor to Thiokol Corporation, Bristol, Pa.

Filed Nov. 4, 1966, Ser. No. 592,209
Int. Cl. B63h *11/10*; B64c *15/00*
U.S. Cl. 239—265.19 **7 Claims**



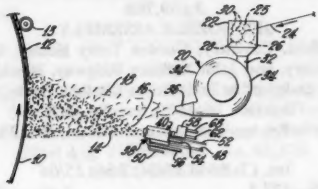
A fixed, convergent-divergent, rocket nozzle having a movable throat section seated in spherical relationship to adjacent surfaces; so that the rocket may be steered by rotating the throat section.

3,659,790

METHOD AND APPARATUS FOR APPLYING COATING MATERIAL

Robert J. Gelin, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation

Filed Apr. 24, 1970, Ser. No. 31,709
Int. Cl. B05b 7/14
U.S. Cl. 239—336 11 Claims



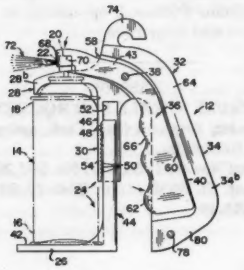
A method and apparatus are provided for spraying reinforced resinous coating material on a surface. Resin and an accelerator are sprayed from one spray device and resin and catalyst are sprayed from a second spray device, each spray being shaped as a horizontally disposed ellipse, as viewed in cross section. The two sprays are directed in converging paths and a flat spray of reinforcing fibers is directed from above in a converging path with the other two sprays. In a preferred form, the resin and accelerator are mixed upstream of one spray device and the resin and catalyst are mixed in a mixing head adjacent the other spray device.

3,659,791

SPRAY GUN ADAPTOR FOR AEROSAL CANS

William O. Clark, Rt. 4, Box 401, Fort Myers, Fla.

Filed Nov. 17, 1969, Ser. No. 877,210
Int. Cl. A47j 45/07
U.S. Cl. 239—375 4 Claims



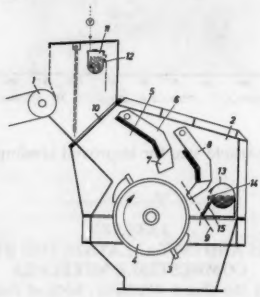
An adaptor device for detachable support to an aerosal spray can having a finger-operative spray knob adapted to be depressed in releasing the spray and aerosal contents of the can. The adaptor device includes convergingly acting base and head sections adapted to lengthwise embrace an aerosal can and includes a handle-like stock projection adapted to be hand-gripped in manipulating the spray can and in spraying the aerosal contents. The adaptor device includes a fulcrumed lever having one end thereof engaging the spray knob of the spray can and having the other end extending along the stock projection. A user of the device sprays the contents of the aerosal can by squeezing the lever and stock elements together.

3,659,792

METHOD OF PROCESSING EFFLUENT SLUDGE

Eugen Von Conrad, Friesenring; Kurt Rosner, and Ludwig Meyer, both of Munster, Westphalia, all of Germany, assignors to Hazemag Hartzerkleinerungs-und Zementmaschinenbau-Gesellschaft mbH, Munster, Germany

Filed Aug. 21, 1969, Ser. No. 851,970
Claims priority, application Germany, Aug. 23, 1968, P 17 84 605.8
Int. Cl. B02c 13/09, 21/00
U.S. Cl. 241—21 8 Claims



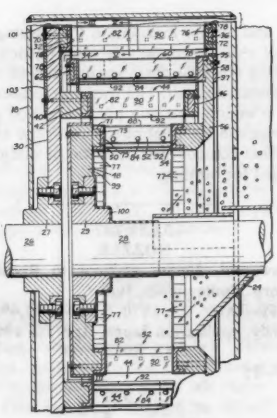
Effluent sludge obtained upon clarification of waste effluent, is admixed with solid refuse either before or subsequent to reduction of the solid refuse to particulate state in an impact grinder.

3,659,793

CAGE MILL

Earle W. Stephenson, Latrobe, Pa.; James G. Newberry, Lakeland, Fla., and Robert C. Hazzard, Mt. Vernon, Ind., assignors to International Minerals & Chemical Corporation, by said Newberry and said Hazzard and Kennametal Inc., Latrobe, Pa., by said Stephenson

Filed Aug. 6, 1969, Ser. No. 847,929
Int. Cl. B02c 7/04
U.S. Cl. 241—187 13 Claims



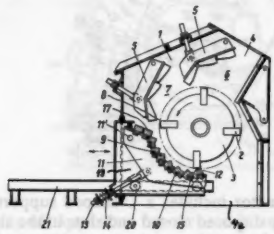
The present invention relates to a cage mill for comminuting material and is particularly concerned with a cage mill having a plurality of counter-rotating cages with the cages widening in the radially outward direction and having hard facing applied to the leading faces of the impact bars and to the axially inner faces of the support rings at the ends of the impact bars.

3,659,794

COMMINUTING DEVICE

Gerhard Hemesath, Munster, Westphalia, Germany, assignor to Hazemag Hartzerkleinerungs -Und Zement-Maschinenbau -Gesellschaft m.b.H., Munster, Germany

Filed June 26, 1970, Ser. No. 50,094
Claims priority, application Germany, July 8, 1969, P 19 34 545.0
Int. Cl. B02c *13/06, 18/08*
U.S. Cl. 241—189 R 9 Claims



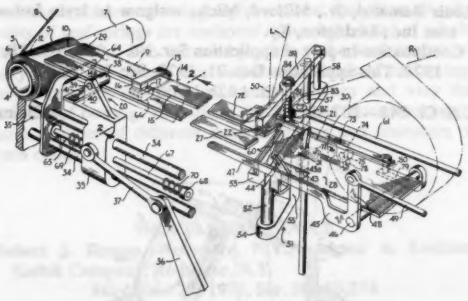
A rotor is mounted in a housing and has circumferentially distributed contact members. Spaced from the rotor are breaker members against which material to be comminuted and admitted into the housing, is flung by the contact members with resulting break-up of such material. The lower portion of the rotor circumference is surrounded by an arcuately curved shell defining with the rotor a channel for comminuted material which tapers in direction towards an outlet of the housing. The shell is composed of supports which mount a plurality of parallel rods extending lengthwise of the rotor axis. Each rod has associated with it a comminuting bar of polygonal cross-section, formed with a longitudinal slot in which the respective rod is lodged. The bars are connected in abutting relationship so that no material can fall through between them.

3,659,795

METHOD OF AND APPARATUS FOR INDIVIDUALLY WINDING COILS WITH PAPER SEPARATING ITS SUCCESSIVE WIRE LAYERS

Robert W. Bachi, Itasca, and John R. Mitchell, Glendale Heights, both of Ill., assignors to Bachi, Inc., Itasca, Ill.

Filed Jan. 2, 1970, Ser. No. 150
Int. Cl. H02k *15/085;* B26d *5/20, 7/06*
U.S. Cl. 242—7.03 14 Claims



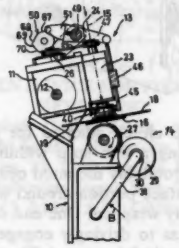
Paper strips are successively severed from strip stock by a guillotine knife which cuts obliquely across the strip stock with the angle of the cut being alternately towards the right and the left; the strips so severed from the stock are fed to a coil being wound with the foremost corner of the leading edge of the strip at the side edge of the strip which is in line with the end of the coil at which the first convolution of the next wire layer is applied, to be gripped between the then outermost wire layer and the wire forming said first convolution of the next layer and drawn about said existing layer while the trailing portion of the strip is held against edgewise displacement by a spring clip which grasps the strip and travels with the strip and is constrained to straight line linear motion normal to the axis of the coil.

3,659,796

YARN WINDING APPARATUS

Erich Bucher, and Alfred Maldener, both of Goppingen, Germany, assignors to Zinser-Textilmaschinen GmbH, Ebersbach, Germany

Filed July 22, 1970, Ser. No. 57,220
Claims priority, application Germany, July 22, 1969, P 19 37 178.9
Int. Cl. B65h *54/28, 54/38*
U.S. Cl. 242—18.1 12 Claims



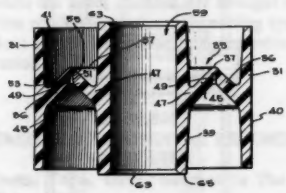
In a yarn winding apparatus the yarn, to effect its deposition on a cross-coil type yarn package, is caused to reciprocate transversally to its direction of feed by means of rotating contour discs. In order to eliminate the formation of circumferential beads adjacent the edges of the yarn package, the winding apparatus comprises means for cyclically displacing said contour discs in a direction normal to their axis of rotation for periodically reducing the amplitude of the transversal reciprocation of the yarn during the winding operation.

3,659,797

TAPE DRIVE ROLLER

Don R. Coy, Palatine, Ill., assignor to Ampex Corporation, Redwood City, Calif.

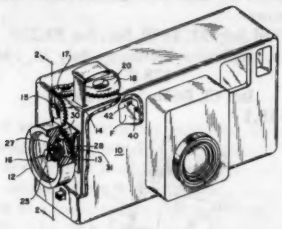
Filed Nov. 26, 1969, Ser. No. 880,306
Int. Cl. B65h *17/48, 17/20*
U.S. Cl. 242—55.19 A 10 Claims



A pressure or pinch member for cooperating with a capstan to transport a tape is formed with a deflectable tape engaging surface to drive the tape at a substantially constant speed without differential slippage which results in "wow," flutter or tape wear. The preferred embodiment of the pressure member is a one piece, plastic pressure roller which has a deflectable section intermediate an outer tape engaging

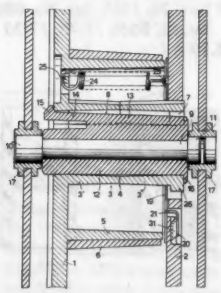
cylindrical wall and an inner cylindrical wall for mounting on a post to replace a conventional elastomeric surfaced pressure roller of the kind used in magnetic tape cartridges.

3,659,798
COIL SPRING SLIP CLUTCH
Fredric A. Mindler, and Charles E. Pickering, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed June 5, 1970, Ser. No. 43,898
Int. Cl. G03b *1/10*
U.S. Cl. 242—71.3 4 Claims



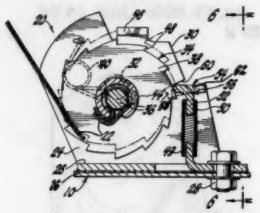
A coil spring slip clutch adapted for use in a roll film camera for advancing a film strip within the camera. The clutch comprises a rotatably mounted cylindrical drive shaft having a smooth surface portion around which the coils of a coil spring are tightly wrapped. One end of the coil spring is bent outwardly so as to drivingly engage a film advancing mechanism when the shaft is rotated. The contacting surfaces of the coil spring and drive shaft are selected from materials which remain in frictional engagement sufficient to cause the coil spring to drive the film advancing mechanism until the retarding force exerted by such mechanism exceeds a critical frictional force characteristic of one of the materials, at which time the coil spring slips relative to the drive shaft.

3,659,799
REEL FOR WINDING TAPE
Giovanni Cerutti; Alessandro Cortona, and Armando Costa, all of Ivrea, Italy, assignors to Ing. C. Olivetti & C. S.p.A., Italy
Filed June 9, 1970, Ser. No. 44,712
Claims priority, application Italy, June 9, 1969, 52153 A/69
Int. Cl. B65h *75/18*, *75/14*
U.S. Cl. 242—71.9 7 Claims



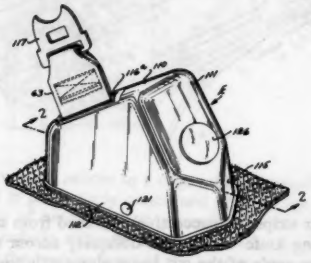
A take-up reel having a pair of flanges is described. One of the flanges is removable and is biased toward the fixed flange. The spacing between the flanges is slightly less than the width of the tape so that the tape is firmly held by the reel. The means which biases the removable flange includes a ring which is nonrotatable with respect to the hub of the reel but which is axially movable relative to the hub.

3,659,800
SEAT BELT RETRACTOR
Barthold F. Meyer, Mt. Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed June 29, 1970, Ser. No. 50,564
Int. Cl. A62b *35/00*
U.S. Cl. 242—107.4 8 Claims



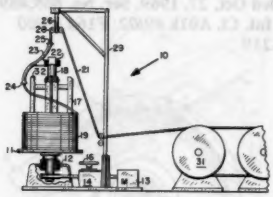
A seat belt retractor includes a U-shaped support having generally vertically disposed closed end slots in the side walls thereof. A reel having ratchet toothed end plates and a shaft mounts a seat belt. The ends of the shaft are received within the slots and torsion springs bias the shaft ends into engagement with the lower ends of the slots. The reel is spring biased in a belt retracting direction. A pawl is movable mounted on the side walls of the frame and normally located against movement by a columnar spring. Cooperating cam surfaces on the pawl and side walls move the pawl laterally of and into engagement with the ratchet plates of the reel when the pawl moves laterally of the side walls or longitudinally of the reel. When belt acceleration or movement of the belt in an extending direction exceeds a predetermined rate, the reel moves bodily upwardly with respect to the frame as the shaft ends move within the slots, and the ratchet plates of the reel engage cooperating teeth on the side walls of the frame to block further rotation of the reel in a belt extending direction. When the pawl is subjected to an acceleration pulse of predetermined amplitude and time longitudinally thereof and generally normal to the direction of bodily movement of the reel, the pawl moves laterally of the side walls and into engagement with the ratchet plates of the reel to provide a fulcrum for movement of the reel bodily upwardly so that the ratchet plates of the reel again engage the cooperating teeth on the side walls of the frame. When the pulse is laterally of the pawl, it also moves into engagement with the ratchet plates to provide the same fulcrum.

3,659,801
SEAT BELT RETRACTOR COVER
Louis Romanzi, Jr., Milford, Mich., assignor to Irvin Industries Inc., Lexington, Ky.
Continuation-in-part of application Ser. No. 3,087, Jan. 15, 1970. This application Oct. 21, 1970, Ser. No. 82,770
Int. Cl. A62b *35/00*
U.S. Cl. 242—107 SB 4 Claims



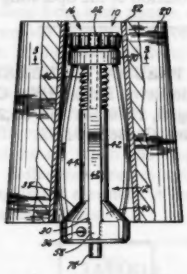
A seat belt retractor cover which may be attached to the retractor to form a unitary assemblage prior to installation in a vehicle.

3,659,802
COIL PAY OFF
Henry A. Agonis, Stamford, Conn., assignor to Anaconda Wire Cable Company
Filed Mar. 11, 1970, Ser. No. 18,438
Int. Cl. B65h 49/00
U.S. Cl. 242—128 8 Claims



In a pay-off apparatus for wire, coils are laid upon a platform that is driven to rotate on a vertical axis while the wire is pulled off through an overhead guide. A delivery tube, freely rotatable around the platform axis, directs the wire from the coil to the overhead guide.

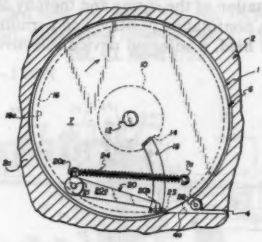
3,659,803
CONE HOLDER
Jakier Barski, 9 Weller Terrace, Saddlebrook, N.J.
Filed June 8, 1970, Ser. No. 44,117
Int. Cl. B65h 49/02; D03j 5/08
U.S. Cl. 242—130.1 7 Claims



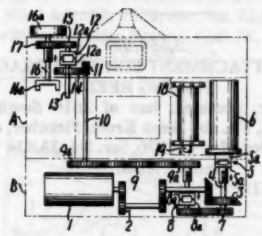
A device for simple and firmly positioning a yarn cone in a knitting machine, allowing rapid removal therefrom. A plurality of leaf springs are anchored around the head of a bolt-shaped member. The threaded portion of the neck carrier axially adjustable means receiving the free ends of the springs to change the compressive forces on them and vary the amount of bowing. This allows the device to accommodate a large number of different internal shapes and diameters of yarn cones.

3,659,804
WEB TAKE-UP DEVICE
Robert J. Roman, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed June 26, 1970, Ser. No. 50,274
Int. Cl. G03b 1/04; G11b 15/32, 23/04
U.S. Cl. 242—195 9 Claims

An automatic web take-up device for apparatus, such as a motion picture projector, includes a film take-up reel with an arm attached to one flange of the film take-up reel. As film (or other web material) is fed to the device, the reel is rotated in a take-up direction and a hook-end portion of the arm engages the leading end portion of the film. The arm then guides the film end to a core portion of the reel as the reel continues to rotate. The film is released smoothly during rotation of the reel in an unwinding direction. The device may be completely self-contained, i.e., it can be added or removed from the associated apparatus as a unit.



3,659,805
MOTOR-DRIVEN DEVICE FOR FILM WINDING OR REWINDING
Kaoru Umeda, Sakai, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Minami-ku, Osaka, Japan
Filed Aug. 19, 1969, Ser. No. 851,266
Claims priority, application Japan, Sept. 27, 1968, 43/84885
Int. Cl. B11b 15/32; G03b 1/04
U.S. Cl. 242—201 7 Claims

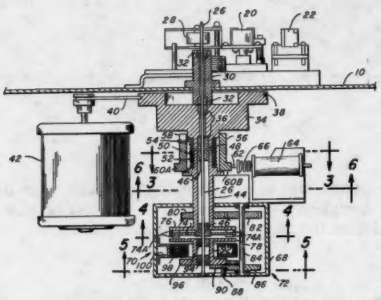


A motor-driven device for winding or rewinding a film in a camera comprises first and second rewinding clutches provided respectively at the initial and terminal portions of a film rewinding drive system and a lever mechanism. Upon the actuation of an operating member the rewinding clutches are simultaneously brought into engagement while a winding clutch and a clutch in a sprocket gear are disengaged, and upon the release of the member the rewinding clutches are disengaged while the latter clutches are brought into engagement. Thus, the rewinding action transmitting system can be left independent of the film winding drive system during film winding operation.

3,659,806
REVERSIBLE INCREMENTAL RECORDING APPARATUS
Robert L. Crafts, Tulsa, Okla., assignor to The Telex Corporation, Tulsa, Okla.
Filed Dec. 14, 1970, Ser. No. 97,712
Int. Cl. B11b 15/32; G03b 1/04
U.S. Cl. 242—201 8 Claims

A reversible incremental recording apparatus for moving tape incrementally past a recording head including a rotating capstan, a continuously rotated flywheel supported about the capstan, a drive collar rotatably supported about the capstan, a coil spring coaxially received about a portion of the rotating flywheel and the drive collar normally tending to wind

about both elements to rotate the drive collar with the flywheel, the spring having a radial extending tang at one end thereof, a tubular ratchet member received about the spring and receiving the tang, the ratchet member serving to prevent the rotation of the spring and thereby the drive collar when held in a nonrotating position and permitting such rotation when not held, a solenoid device selectively holding or



permitting the ratchet member to rotate, a clutch having a driven portion affixed to the capstan shaft, a forward drive portion affixed to the drive collar, and a rearward rotating drive portion rotated by gear means coupling the rearward drive portion to the drive collar, and a coil assembly for selectively coupling the clutch driven portion to one of the forward and reverse drive portions.

3,659,807

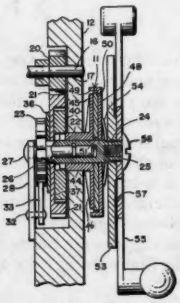
BRAKE ATTACHMENT FOR STAR DRAG TYPE FISHING REELS

Oscar Fleischer, deceased, late of 2610 South West 21st Street, Miami, Fla. (by Helen Krohn Fleischer, executrix)

Filed May 1, 1970, Ser. No. 33,836

Int. Cl. A01k *89/02*

U.S. Cl. 242—219 **4 Claims**



An improved brake attachment for conventional star drag type fishing reels wherein the attachment may be incorporated in the original assembly thereof or as a replacement of a greater number of parts forming the conventional brake mechanism, the attachment consisting of four parts, namely, a drive disk to be rotatably mounted on the conventional drive shaft and positioned within the recess of the conventional driving gear so as to rotate in unison with the driving gear, a brake disk rotatably mounted on the drive shaft and secured to also rotate in unison with the driving gear, and a brake shoe slidably mounted on the drive shaft adjacent the brake disk with a brake member interposed between the drive disk and the brake shoe whereby upon actuation of the star wheel the frictional engagement of the brake shoe and brake disk may be adjusted to provide the desired drag.

3,659,808

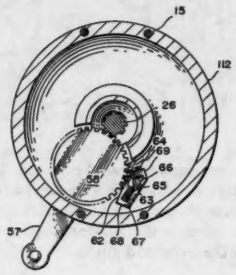
ONE WAY DRIVE FOR FISHING REELS

Oscar Fleischer, deceased, late of 2610 S. W. 21st Street, Miami, Fla. (by Helen Krohn Fleischer, executrix)

Filed Oct. 27, 1969, Ser. No. 869,489

Int. Cl. A01k *89/02*; **F16d** *63/00*

U.S. Cl. 242—219 **3 Claims**



A one way drive for fishing reels to prevent the inadvertent reverse rotation of the spool operating handle having an arcuate gear section with teeth normally in engagement with the spool rotating gear which permits the rotation of the latter in the direction to wind the fishing line on the spool but prevents the reverse rotation of the operating handle.

3,659,809

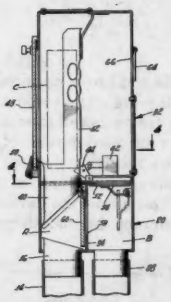
PUSH-PULL PNEUMATIC TUBE SYSTEM

Ross Cook, 85 Eastfield Drive, Rolling Hills, Calif.

Filed Aug. 5, 1970, Ser. No. 61,259

Int. Cl. B65g *51/32*

U.S. Cl. 243—19 **13 Claims**



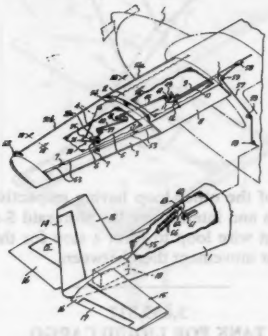
The push-pull pneumatic tube system includes two terminals connected together by a single tube. One terminal is selectively subjected to a positive or negative pressure in order to push the carrier to the remote terminal or to pull the carrier to the near terminal. A simple spring gravity or friction held door may be used on the receiver part of the near terminal without danger of its being blown open, by providing a bypass operative in response to the existence of positive air pressure.

3,659,810

INHERENTLY STABLE TAPERED WING FLAPERON AIRPLANE

James L. Robertson, 15400 Sunset Hwy., Bellevue Airfield, Bellevue, Wash.

Original application May 20, 1968, Ser. No. 730,516, now Patent No. 3,539,133, dated Nov. 10, 1970. Divided and this application Mar. 10, 1970, Ser. No. 23,113
Int. Cl. B64c *13/04*
U.S. Cl. 244—76 R 9 Claims



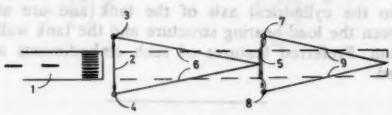
Flaperon-actuating linkage is moved by flap-actuating means to coordinate flaperon droop with flap deflection so that initially the flaperon droop increases with flap deflection and, subsequently, the flaperon droop decreases as flap deflection continues to increase. The wing panels ahead of the flaperons are tapered in planform and their leading edges are more blunt and rounded than the leading edge portions of the wing inboard from such panels, such outboard leading edge portions provide high-lift and postpone stall at the high angles of attack of the outboard wing panels resulting from downward deflection of a flaperon from its maximum drooped position. Jaw cranks connect flaperon push rods to both the flap-controlled flaperon droop setting means and the flaperon differential deflection control means. To lighten nose-up control forces when the flaps and flaperons are deflected, flap deflection stresses springs opposing down-springing loading on the elevators. A fence is aligned with the inboard end of each flaperon.

3,659,811

SAFETY DEVICE FOR AIRCRAFT BARRIERS

Leif Mathias Borehag, Norrkoping, Sweden, assignor to Borgs Fabriks AB, Norrkoping, Sweden

Filed Oct. 23, 1970, Ser. No. 83,437
Claims priority, application Sweden, Dec. 22, 1969, 17715
Int. Cl. B64f *1/02*
U.S. Cl. 244—110 C 4 Claims



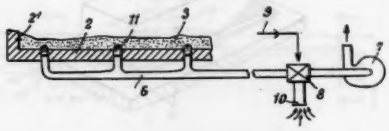
An aircraft arresting system comprising a wire arranged in the path of a landing aircraft and adapted to be engaged by a hook on the aircraft. The ends of the wire are connected to brakes. A barrier net is located behind the wire and is spaced therefrom. Means is provided for raising the barrier net to position it in the path of the aircraft whenever an aircraft fails to engage the wire, with means provided for permitting the barrier net to remain lowered and out of the path of the aircraft when the aircraft successfully engages with the wire.

3,659,812

PATH HAVING VARIABLE RESISTANCE TO VEHICLES MOVING ON IT

Sixten Einar Carlsson, Norrkoping, Sweden, assignor to Borgs Fabriks AB, Norrkoping, Sweden

Filed Sept. 24, 1970, Ser. No. 75,168
Claims priority, application Sweden, Dec. 1, 1969, 16482/69
Int. Cl. B64f *1/02*
U.S. Cl. 244—114 R 8 Claims



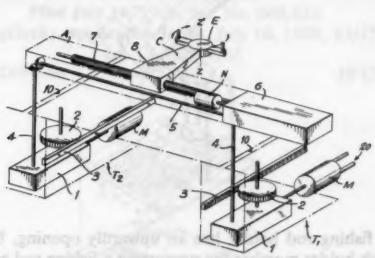
A runway or landing surface for vehicles and particularly aircraft, such surface including a casing or enclosure containing granular material, the casing being connected to means for producing a vacuum within it to an extent to cause compaction of the granular material in order to produce a hard landing surface, and means for breaking or reducing the vacuum or its effect when a soft surface is desired to thereby result in resistance to forward movement of the aircraft or other vehicle.

3,659,813

APPARATUS FOR DOCKING A HELICOPTER

Jean Dominique Francois Gerard Mesnet, London, England; Raymond Louis Le Guennec, Lorient, and Georges Edouard Louis Leon Dadon, Kremlin Bicetre, both of France, assignors to Etat Francais, Paris, France

Filed Apr. 28, 1970, Ser. No. 32,656
Claims priority, application France, Apr. 28, 1969, 6913376
Int. Cl. B64f *1/12*
U.S. Cl. 244—116 10 Claims



A helicopter is attached, at its center of rotation on its wheels, to a turnable coupling of a trolley. The trolley is displaceable along a worm gear mounted in a cross strut and the cross strut is driven in a linear path by a drive mechanism located beneath the surface on which the helicopter rests. The trolley is displaceable on the worm gear along a line which is angularly offset from the linear path of travel of the cross strut and preferably perpendicularly thereto. The helicopter may then be moved along any path of travel by selective combination of the rates of drive of the cross strut and the trolley thereon.

3,659,814

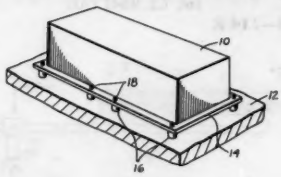
LOAD RESPONSIVE DEVICE AND METHOD OF MAKING

John E. Rode, Ligonier, Pa., assignor to Temper Corporation, Ligonier, Pa.

Filed May 18, 1970, Ser. No. 37,958
Int. Cl. F16m *3/00*
U.S. Cl. 248—23 21 Claims

The specification discloses a load responsive device, particularly in the form of a support cell. The support cell is par-

ticularly useful in the process of installing heavy machinery and the like. In making such an installation, the support cells are distributed between the machinery and the foundation therefor and support the machinery during the adjustment thereof to the proper, usually level, position. The support cells are particularly characterized in yielding at a substantially constant load over a substantial range of movement and are selected as to load bearing capacity so that the total number of support cells beneath the machinery will support more than the weight of the machinery while a smaller number of the cells will not support the weight of the machinery without yielding.

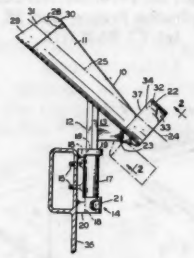


3,659,815

FISHING ROD HOLDER

Albert J. Stefanowitz, and Kathleen E. Stefanowitz, both of 15656 S. E. Division, Space 11, Portland, Oreg.

Filed Oct. 9, 1970, Ser. No. 79,537
Int. Cl. A01k 97/10
U.S. Cl. 248—42 **4 Claims**



A fishing rod holder has an upwardly opening, U-shaped trough holder member for supporting a fishing rod and a ring member pivotally mounted rearwardly of the holder member and having an internal diameter sufficient to permit the end of the fishing rod to pass therethrough. The ring member is pivotal between a first position in which its longitudinal axis is colinear with the longitudinal axis of the holder member when the fishing rod is supported thereby, and a second position in which the longitudinal axis of the ring member is generally vertical. In this latter position, the ring member permits the end of the fishing rod to pass further through it and contact the gunwale, the reel on the fishing rod being retained by the ring member when in this second position.

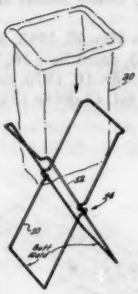
3,659,816

COLLAPSIBLE STAND

James D. Wilson, Long Beach, Calif., assignor to Banner Metals, Inc., Compton, Calif.

Filed Oct. 30, 1970, Ser. No. 85,359
Int. Cl. B65b 67/12
U.S. Cl. 248—97 **1 Claim**

An improved self-supporting collapsible stand is provided for plastic trash bags, laundry bags, or the like. The stand of the invention is formed of a pair of essentially rectangular wire-formed loops which extend transversely to one another in a pivotal X-like relationship. The sides of one of the wire loops have respective intermediate S-shaped portions therein, and the sides of the other loop having respective U-shaped portions therein and intersecting the aforesaid S-shaped portions of the first wire loop to form a stop for the loops and limit the angular movement therebetween.

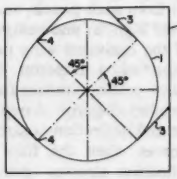


3,659,817

TANK FOR LIQUID CARGO

Willem P. Hendal, Amsterdam, Netherlands, and Lionel R. Prew, Farnham, England, assignors to Shell Oil Company, New York, N.Y.

Filed Mar. 23, 1970, Ser. No. 21,688
Claims priority, application Great Britain, Mar. 31, 1969, 16,619/69
Int. Cl. F16m 1/00
U.S. Cl. 248—317 **17 Claims**



Means are disclosed for storing and transporting liquid cargo, which means include a substantially cylindrical tank and means for supporting such tank from an overhead load-bearing structure with the cylindrical axis of the tank normally horizontal and in which the means for supporting the tank give rise to tensile stresses in the tank wall and reduced bending stresses, whereby the tank wall may be made thinner for a given cargo. Various embodiments of such means are described, all of which include at least two circular arrays each of at least four load-bearing elements, which elements of each array extend upwardly and tangentially from the cylindrical tank wall in a common vertical plane perpendicular to the cylindrical axis of the tank and are attached between the load-bearing structure and the tank wall under tension. Preferred features of such embodiments are disclosed.

3,659,818

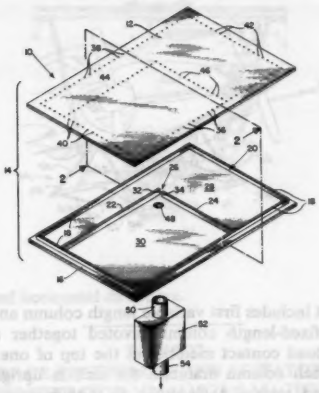
UNITARY VACUUM HOLD DOWN APPARATUS FOR LARGE AND SMALL RECORD SHEETS

Stephen H. Duncan, Denver, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 21, 1970, Ser. No. 66,023
Int. Cl. G03b 27/60
U.S. Cl. 248—363 **10 Claims**

A noiseless unitary apparatus to retain small and large size record sheets in selected fixed positions on different parts of

a perforated surface of a vacuum chamber by providing a wall within the chamber that No. 1 divides the chamber into two vacuum areas and that No. 2 has a restricted air



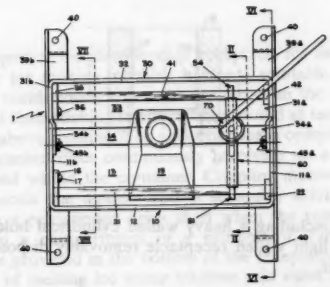
passageway formed therein to reduce the flow of air between one vacuum area and the other while it is being drawn by a vacuum impeller through any of the perforated surfaces that are not covered by one of said record sheets.

3,659,819

CHAIR IRON

Richard H. Wolters, East Grand Rapids, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.

Filed June 8, 1970, Ser. No. 43,995
Int. Cl. A47c *3/00*
U.S. Cl. 248—373 **38 Claims**



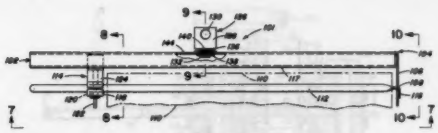
The preferred embodiment of the chair iron includes a seat platform pivotally mounted to a frame which in turn is supportable by a chair base. A torsion rod is mounted on the frame with one end fixed and one end free to rotate. A second torsion rod is similarly mounted on the platform, parallel to the first. A pair of levers are slidably mounted on the rods and are maintained in alignment by a bracket assembly. This assembly also includes a cam and pin arrangement whereby a pretension force can be applied to the levers and thereby to the torsion rods.

3,659,820

BOOK HOLDING BRACKET AND RACK

Robert D. Slifstein, 6 Dudley Lane, Dix Hills, N.Y., and Bernard Blaker, 139 Forest Drive, Jericho, N.Y.

Filed Jan. 16, 1970, Ser. No. 3,330
Int. Cl. A47b *63/06*
U.S. Cl. 248—447 **11 Claims**



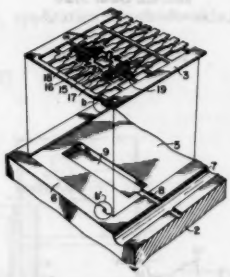
A book holding bracket, adjustable to books of varying back lengths, for suspending books by their backs with their free page edges downward when not in use, and provided with means for swinging or rotating the books upwards about 180° in a vertical plane to permit opening the books and turning the pages sideways right to left in the usual manner, and also provided with means for rotating or swivelling the upturned books in a horizontal plane, for example about 90°, to permit opening and viewing of books required to be read or viewed with the free edge of the page closest to, and the bound edge of the page furthest from, the viewer, i.e. the printing, intelligence or other matter to be viewed is parallel to the bound edge of the page; and a rack, stationary or movable, for holding one or a plurality of such brackets.

3,659,821

STRUCTURE FOR PLASTIC ENCAPSULATION OF SEMICONDUCTOR DEVICES

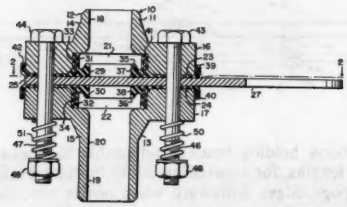
Yuzaburo Sakamoto, and Keizo Otsuki, both of Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed July 10, 1969, Ser. No. 840,634
Claims priority, application Japan, July 10, 1968, 43/47752
Int. Cl. B29f *1/06*
U.S. Cl. 249—84 **10 Claims**



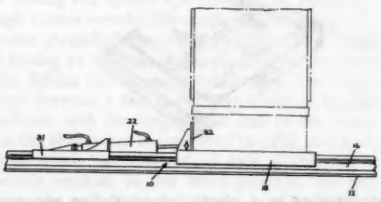
An improvement in a plastic encapsulating process for semi-conductor devices, wherein parts of a sheet-like thin insert are embedded in plastic material injected into cavities in a two-part mold, said insert being loaded or positioned on the cavity part of said mold, characterized in that at least either a projected or recesses portion, and correspondingly either a recessed or projected portion, have been in advance constructed respectively on each side edge of said insert and on said cavity part of the mold near the injection gate therein contacting each other so as to prevent an outflow of plastic material from said injection gate along a peripheral gap created between said side edge of the insert and the cavity part of the mold any further than their contacting point which acts as a stopper in said gap, producing an undesirable channel for plastic material to flow.

3,659,822
NON-SEIZING SLIDE VALVES
Joseph G. Nagy, Box 126, Yarbo, Saskatchewan, Canada
Filed Jan. 22, 1971, Ser. No. 107,750
Int. Cl. F16k 1/16
U.S. Cl. 251—178 4 Claims



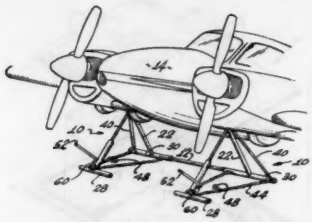
A non-seizing slide valve is disclosed including a valve body having first and second halves between which a lever actuated valve plate is pivoted for sliding between open and closed positions. First and second gaskets are disposed between the sliding valve plate and first and second valve body halves. Formed of flexible and resilient material, the two gaskets include inner and outer annular flanges that are reinforced by rigid rings embedded in the gasket flanges. The valve parts are held in assembled relationship by two through bolts having shanks encircled by compression coil springs that press the gaskets against the valve plate.

3,659,823
DEVICE FOR MOVING LARGE AND HEAVY APPARATUS
Kenneth H. Griffin, Uniondale, Ind., assignor to G & L Corporation, Fort Wayne, Ind.
Filed Apr. 8, 1970, Ser. No. 26,542
Int. Cl. B66f 3/24
U.S. Cl. 254—93 8 Claims



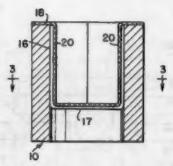
A device for moving large and heavy apparatus comprising an elongated support member secured to a frame, a load shoe is carried by the support member for movement longitudinally of the support member. In a specific embodiment, two such devices are positioned side by side and a large and heavy load, for example, a transformer, is positioned on the load shoes of the two devices. The elongated support members of the devices are generally parallel to each other. A fluid actuated cylinder is connected to each load shoe, the cylinders being connected to a common pressurized fluid source and control.

3,659,824
AIRPLANE JACK
Philip L. Johnson, 9710 Ocean Gate, Inglewood, Calif.
Filed Dec. 15, 1969, Ser. No. 885,244
Int. Cl. B66f 3/00
U.S. Cl. 254—124 6 Claims



Basic unit includes first variable length column and second preferably fixed-length column pivoted together at upper ends, with load contact member at the top of one column. Bases on each column maintain the unit in upright plane. Bases pushed toward each other to initially engage load. Variable length chain holds bases at desired spacing. At least one base frictionally engages ground to prevent undesired movement. First column is extended to swing second column toward vertical and raise load. To lift airplane struts located below load contact member, cable unit is attached to load contact member and extends down to strut to lift in tension. Two basic units are connected in laterally spaced relation for two-point lifting. Third support arm may be added to provide for three-point parallelogram-type lifting of entire airplane.

3,659,825
DISH FOR MIXING DENTURE REPAIR MATERIALS
Gabriel Reiter, 8204 Ventner Ave., Margate City, N.J.
Filed June 24, 1970, Ser. No. 49,385
Int. Cl. B01f 13/00
U.S. Cl. 259—60 6 Claims

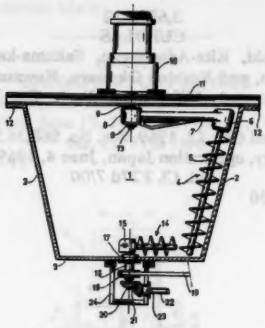


A dish including a heavy walled cylindrical holder and a relatively light walled receptacle removably disposed within said holder.

3,659,826
DEVICE FOR TREATING ONE OR MORE SUBSTANCES IN A VESSEL PROVIDED WITH AT LEAST ONE ROTATABLE STIRRING MEMBER
Constant Johan Nauta, Overveen, Netherlands, assignor to Nautamix Patent A.G., Zug, Switzerland
Filed Dec. 22, 1970, Ser. No. 100,575
Claims priority, application Netherlands, Dec. 30, 1969, 6919610
Int. Cl. B01f 7/00
U.S. Cl. 259—102 10 Claims

The present apparatus includes a vessel provided with a

pair of agitators mounted to stir and mix substances in both



vertical and horizontal directions.

3,659,827

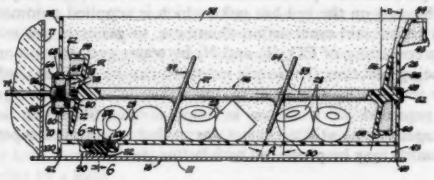
STORAGE RECEPTACLE AND AGITATOR FOR REFRIGERATOR ICE MAKING MACHINES

Thomas H. Fogt, West Carrollton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 14, 1971, Ser. No. 106,430

Int. Cl. B01f 7/10; F25c 5/00

U.S. Cl. 259—110 **4 Claims**



A refrigerator ice piece storage receptacle for use with an automatic ice making machine having a rotatable agitating means to continuously move the ice pieces in the container to prevent their sticking together when stored at temperature below or above freezing. The agitating means comprise a plurality of canted discs continuously revolving on a common agitator rod within the container. Coupling means are provided wherein the agitator rod is separably drivingly connected to a refrigerator drive shaft when the receptacle is located in a compartment of a refrigerator. Drain valve means are provided in the bottom of the receptacle to drain the same of melting ice water wherein said valve automatically closes when the receptacle is removed from the refrigerator for placement on a countertop surface.

3,659,828

DOUGH KNEADING APPARATUS FOR FORMING PASTRY SHELLS

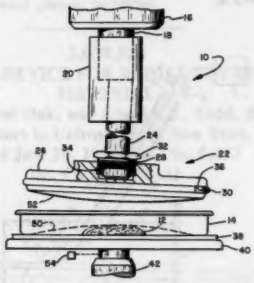
Harold G. Valentine, 117 Manners, Brockton, Mass.

Filed Oct. 7, 1970, Ser. No. 78,759

Int. Cl. A21c 1/00

U.S. Cl. 259—190 **10 Claims**

A kneading member having a shaft journaled thereto is positioned within a pan having a charge of dough therein. The shaft of a drive motor is fixed to the kneading member shaft by means of a coupler in such a way that the axis of the motor shaft is concentric with the axis of the coupler and the axis of the kneading member shaft is angularly offset from the axis of the motor shaft. The kneading member is provided with an "O" ring about its periphery for sealable engagement with the sidewalls of the pan, both the pan and the kneading member being fixed against rotation. The angular



offset of the kneading member shaft with respect to the motor shaft and the journaled connection between the kneading member shaft and the kneading member are such that rotational movement of the kneading member shaft is translated into a non-rotating undulatory movement of the kneading member within the pan. In consequence, the dough is kneaded into the form of a pastry shell.

3,659,829

METHOD FOR ADJUSTMENT OF THE HEAT GENERATING PROCESS IN A ROTARY KILN WITH A HEAT EXCHANGER ETC.

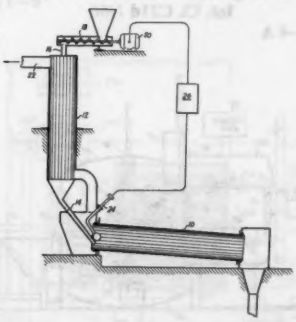
Jaroslav Pospisil, and Josef Pisek, both of Dvorakova, Czechoslovakia, assignors to Prerovske strojirny, narodni podnik, Prerov, Czechoslovakia

Continuation-in-part of application Ser. No. 810,844, Mar. 26, 1969, now abandoned. This application Sept. 28, 1970, Ser. No. 75,836

Claims priority, application Czechoslovakia, Mar. 27, 1968, 2370-68

Int. Cl. F27b 7/02

U.S. Cl. 263—32 **4 Claims**



A rotary kiln system employing a pre-heater for feeding material to the kiln. A temperature sensing device is placed in the gas outlet of the rotary kiln and control means are provided to regulate the rate of feed of raw material to the preheater in response to variations in sensed temperature from a predetermined level.

3,659,830

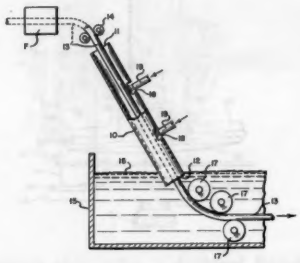
DESCALING COPPER RODS

Clermont J. Snyder, and Jack P. Moore, both of Hastings-on-Hudson, N.Y., assignors to Anaconda Wire and Cable Company

Original application July 31, 1968, Ser. No. 749,013, now Patent No. 3,546,029. Divided and this application Apr. 16, 1970, Ser. No. 33,128

Int. Cl. C21d 9/56

U.S. Cl. 266—3 R 4 Claims



Scale is removed from a copper rod by continuously introducing the copper rod at a temperature below 1,000° F. into a descaling zone wherein the rod is exposed to a reducing atmosphere and is heated in such atmosphere to a temperature above 1,100° F. (preferably between 1,200° F. and 1,400° F.) to effect substantially complete reduction to metallic copper of the oxide scale. Immediately thereafter the rod is quenched in a liquid (preferably aqueous) coolant to a temperature below that at which any substantial reoxidation can occur before exposing the rod to an oxidizing environment. Apparatus for carrying out such descaling operation comprises a tubular descaling chamber through which the rod is passed, burners positioned to direct a reducing flame into the interior of the chamber, and a coolant vessel containing a liquid coolant in which the rod exit end of the descaling chamber is immersed.

3,659,831

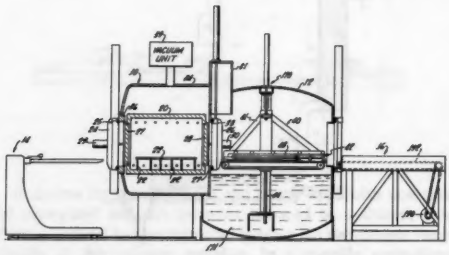
INTEGRAL QUENCH FURNACE AND TRANSFER MECHANISM

Russell H. Reber, Orange, and Harold E. Mescher, Pico Rivera, both of Calif., assignors to Pacific Scientific Company, City of Commerce, Calif.

Filed Aug. 25, 1969, Ser. No. 852,671

Int. Cl. C21d 1/66

U.S. Cl. 266—4 A 22 Claims



An integral quench furnace system and transfer mechanism for removing a heat treated charge from the furnace chamber into the quench media and onto an unloading platform. The transfer mechanism includes a forked loading cart mounted on the quench chamber A-frame for movement into the furnace and onto the unloading platform through a hydraulic motor driven chain and sprocket arrangement.

3,659,832

CUPOLAS

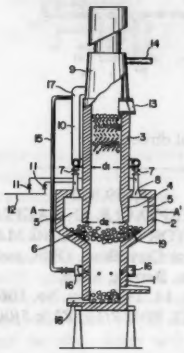
Akira Takahashi, Kita-Adachi-gun, Saitama-ken; Akimasa Arata, Tokyo, and Yoshimi Okawara, Kawasaki-shi, all of Japan, assignors to Mifuji Iron Works Co., Ltd., Tokyo, Japan

Filed Oct. 22, 1969, Ser. No. 868,363

Claims priority, application Japan, June 4, 1969, 44/44211

Int. Cl. F27d 7/00

U.S. Cl. 266—30 2 Claims



Combustion gases are generated in the liquid fuel combustion chambers provided on the middle shell of a cupola and blasted on the red-hot coke which is supplied automatically below said combustion chambers, to generate gas mixtures consisting of CO, H_2 and N_2 by water gas reaction and reducing reaction. These gas mixtures can be used as useful heat sources. By this process, the steam which has been so far regarded as a taboo in cupola operations can advantageously be utilized as hot gas so that cast iron of superior quality may be produced with better yields.

3,659,833

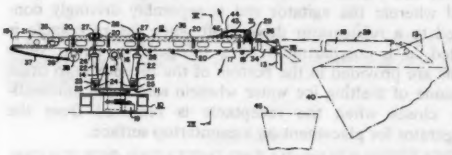
LADLE SKIMMER

Louis A. Grant, Pittsburgh, Pa., assignor to Louis A. Grant Inc.

Filed Jan. 19, 1971, Ser. No. 107,676

Int. Cl. F27d 23/00

U.S. Cl. 266—37 6 Claims



The specification discloses a skimmer mechanism comprising a supporting platform or structure, a turntable rotatably mounted on said supporting platform, a power operated means for imparting a rotary movement to the turntable, a boom assembly pivotally mounted on said turntable and including an extensible and retractable boom section on said boom assembly, a pivotable skimmer blade or paddle mounted at the outer end of said boom section, power operated means for pivotally moving said boom assembly

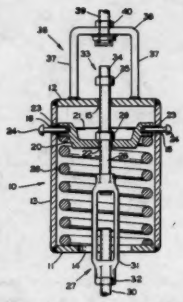
relative to said turntable, power operated means for extending and retracting said boom section with respect to the boom assembly, and power operated means for pivotally actuating the skimmer blade.

3,659,834

SPRING SUPPORT DEVICE

Leonard S. Suozzo, 366 Maple Hill Drive, Hackensack, N.J.

Filed June 10, 1970, Ser. No. 44,976
Int. Cl. F16f 1/06
U.S. Cl. 267—70 **7 Claims**



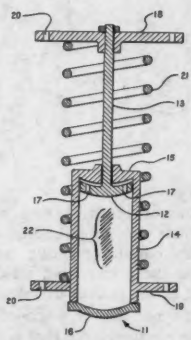
A spring support device including a housing having a lower wall and an upper wall, a helical compression spring within the housing and bearing at its lower end against the lower wall, a spring backing plate within the housing and bearing against the upper end of the spring, and a load-carrying unit extending through the spring and the lower wall and engaging the backing plate. In one embodiment, the load-carrying unit includes a threaded rod extending through the upper wall. In another embodiment, a pair of spaced threaded rods, which are parallel to the path of movement of the load-carrying unit, are secured to the backing plate and extend through the upper wall. In both embodiments, the rods are provided with nuts that are operable from the exterior of the housing for adjustably limiting downward travel of the backing plate and the load-carrying unit and, therefore, the force applied to the spring by a load.

3,659,835

IMPACT KINETIC ENERGY ABSORBER WITH AUTOMATIC RESET

Gerald H. Peterson, 520 Russ Bldg., San Francisco, Calif.

Filed Oct. 12, 1970, Ser. No. 79,722
Int. Cl. F16f 9/30
U.S. Cl. 267—136 **4 Claims**



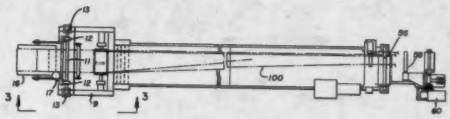
In impact kinetic energy absorber with automatic reset in which the kinetic energy on impact is absorbed by forcing a plunger with an enlarged head through plastic material within a cylinder under pressure below the yield point of the plastic material so that said plastic material is in solid form and which has a resilient means operatively arranged between said plunger and said cylinder sufficiently loaded therebetween to force said plunger with enlarged head back through said plastic material in solid form to reset said impact absorber after impact and to absorb some kinetic energy on impact in addition to that absorbed by forcing said plunger through said plastic material.

3,659,836

FOLD-OVER DEVICE FOR RADIAL PLY BREAKER MATERIAL

Omero Neri, Royal Oak, and Charles E. Todd, Detroit, both of Mich., assignors to Uniroyal, Inc., New York, N.Y.

Filed Jan. 28, 1970, Ser. No. 6,451
Int. Cl. B45h 45/22
U.S. Cl. 270—86 **15 Claims**



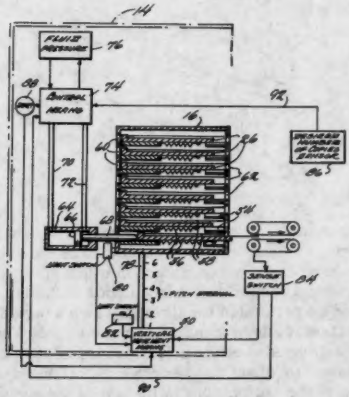
A fold-over device for continuously folding over ply stock or like material, e.g., rubberized tire cord fabric, is disclosed the device being characterized by the presence of a series of rollers arranged in an oblique line along a conveyor and which progressively direct the free edge of the folded-over portion of the stock material into a predetermined overlying relationship with the free edge of the remaining portion of said stock material with edge control means being provided to align the edges of the folded over material with each other in superposed or stepped off relation just prior to the time the layers are adhered together, thereby to provide precisely and uniformly folded over stock material.

3,659,837

AUTOMATIC ORIGINAL FORM FEEDING DEVICE FOR THE USE OF A COPYING MACHINE

Minoru Umahashi, Higashi, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Continuation-in-part of application Ser. No. 720,286, Apr. 10, 1968, now abandoned. This application May 7, 1970, Ser. No. 35,539
Int. Cl. B65h 1/08
U.S. Cl. 271—9 **2 Claims**



A device for automatically and successively feeding original forms of varying sizes and thicknesses to a copying

machine. Each original form is individually supported by one of a plurality of vertically spaced, horizontally reciprocable tables which are housed in a vertically movable cabinet to permit automatic and successive feeding of each individual original form to a copying machine.

3,659,838

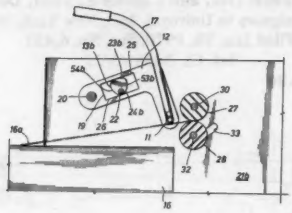
MATERIAL HANDLING DEVICE

Russell L. Davis, Richardson, Tex., assignor to J. W. Hassell, Jr., Dallas County, Tex.

Filed June 12, 1970, Ser. No. 45,852

Int. Cl. B65h *3/08, 5/08*

U.S. Cl. 271—11 **5 Claims**



A pneumatic card pick-up member is moved between first and second positions. In the first position the member picks up a card. In the second position the card is removed from the member by two rollers that tilt the card as it travels through them. The card pick-up member is stopped long enough in the first position for it to pick up a card. It is also stopped long enough in the second position for the card to be engaged between the two rollers and removed from the pick-up member. In between these positions, the pick-up member is moved rapidly.

3,659,839

APPARATUS FOR BRAKING AND OVERLAPPING OF SHEETS MADE OF PAPER OR THE LIKE TO BE DEPOSITED ON A STACK

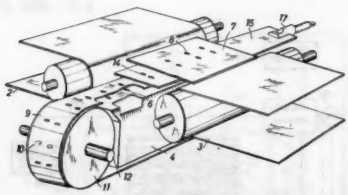
Horst Baucke, Solingen-Ohligs, Germany, assignor to Jagenberg-Werke AG, Dusseldorf, Germany

Filed Mar. 27, 1970, Ser. No. 23,420

Claims priority, application Germany, Apr. 5, 1969, P 19 17 616.0

Int. Cl. B65h *29/68*

U.S. Cl. 271—46 **5 Claims**



An apparatus for braking the advance of and effecting overlapping of sheets of paper, cardboard or the like material that are to be deposited on a stack in which advancing sheets are fed over a suction brake installation including a suction box having a perforated top through which a periodically applied suction is effected and a perforated control belt means movably arranged over the perforated top of the suction box or chamber to align the perforations of the control belt means with the perforations in the top of the suction box or chamber by moving the control belt means in accordance with the rythm of the fed sheet sequence.

3,659,840

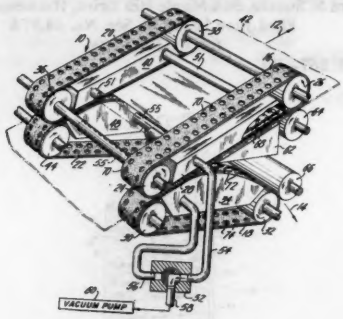
VACUUM GATE

Bernard W. Ruck, Rockville, Conn., assignor to The Connecticut Bank and Trust Company, Hartford, Conn.

Filed June 15, 1970, Ser. No. 46,024

Int. Cl. B65h *29/60*

U.S. Cl. 271—64 **7 Claims**



Sheets of material can be selectively transported along either of two alternative flow-paths each of which is followed by a continuous perforated belt constrained by guides. A vacuum chamber is disposed along each flow-path adjacent to the belt. The vacuum chambers are connected to a valve which is responsive to a control signal to selectively actuate either or both of the chambers. Sheets of material which enter the apparatus follow the flow-path adjacent to the vacuum chamber which has been actuated. The apparatus can be constructed using four perforated belts, two of which run parallel to each other along each of the flow-paths.

3,659,841

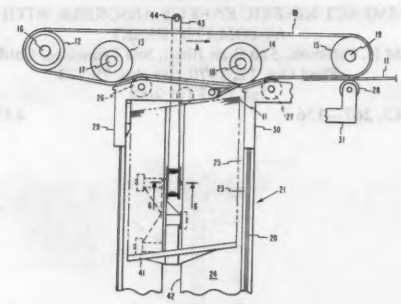
STACKER FOR DOCUMENT CARDS

James M. Rigotti, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 4, 1970, Ser. No. 86,781

Int. Cl. B65h *31/14*

U.S. Cl. 271—88 **7 Claims**



A stacker for document cards having a card receiving pocket, a rotatable roller yieldably disposed at the top of the pocket by means of a cantilever spring, and a supporting plate for the cards in the pocket and yieldably held from downward movement in the pocket by means of a spring of the constant tension type, that is, a coiled spring so constructed as to provide a return force that is constant per unit of width as the spring is unwound from the coil. The spring applied to the supporting plate has a relatively narrow ter-

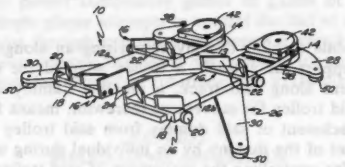
minal portion which is effective for providing a certain force on the supporting plate for the first portion of the stack of cards formed in the pocket and has a relatively wide portion providing a somewhat higher force on the supporting plate for later cards being stacked in the pocket. As the cards enter the pocket, they deflect the cantilever spring while making contact with the roller; and the spring and roller move the cards and the supporting plate downwardly in the card pocket, with the spring preventing a jamming of the cards initially as they enter the pocket and also preventing a subsequent movement of the card stack away from the roller as the card stack increases in height so that the roller continues to control the cards as they enter the pocket.

3,659,842

DRY LAND SKI TRAINING DEVICE HAVING A PAIR OF CANTILEVERED ARMS PIVOTALLY MOUNTED ADJACENT THEIR FORWARD ENDS

Sulo A. Aijala, Attleboro, Mass., assignor to Intricate Machine & Engineering Inc.

Filed Jan. 12, 1970, Ser. No. 2,052
Int. Cl. A63b *69/18*
U.S. Cl. 272—57 B **6 Claims**



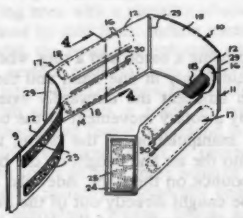
A dry land ski training device having a pair of pivotally mounted cantilever arms, each with adjustable foot support brackets mounted thereon, the cantilever arms having a semi-circular section at their forward ends with a hole at the pivot point, the flat bottom surface of the semi-circular section bearing upon the sloped surface of a support post, and the cantilever arms being bent upwardly at a slight angle to extend outwardly from the support post and give the foot brackets a forward slope. Adjustable brakes are attached to the forward end of the cantilever arms to vary the amount of resistance the user of the device will encounter while pivoting the arms back and forth. Means are also provided for adjusting the lateral distance between the forward ends of the arms.

3,659,843

EXERCISING BELT

John Kojigian, Jr., 3120 East Townsend, Fresno, Calif.

Filed Oct. 27, 1970, Ser. No. 84,419
Int. Cl. A63b *21/26*
U.S. Cl. 272—57 R **2 Claims**



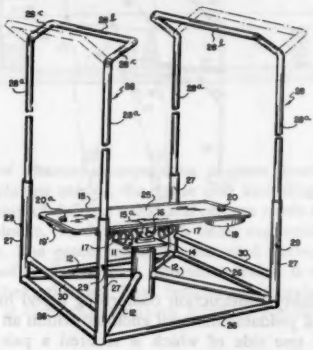
A belt to be worn around the waist of the user for use as a weight-reducing device and exercising device. The belt includes spring members having arranged therein movable balls which cooperate with the spring members and associated parts.

3,659,844

EXERCISES PROPELLED AND BODY SUPPORTING SPRING BIASED PLATFORM

Alfred B. Cummins, 401 Miles Road, Chagrin Falls, Ohio

Filed Aug. 17, 1970, Ser. No. 64,500
Int. Cl. A63b *21/22, 21/00*
U.S. Cl. 272—58 **14 Claims**



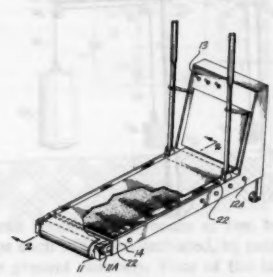
A machine for exercising the human body muscle system has a platform on which the user rests and which is mounted to swivel about a vertical pivot and at the same time to rock or "see-saw" about a central horizontal pivot. The swiveling friction is controlled to some extent by bearing collars. The rocking action is resisted by springs. The rocking load may be increased by attaching weights to the platform. A handlebar support is provided in position to be grasped by a user standing on the platform. Parallel handrails on opposite sides of the platform are adjustable to various positions.

3,659,845

EXERCISE TREADMILL AND BELT SUPPORT APPARATUS

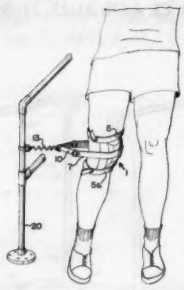
Wayne E. Quinton, Seattle, Wash., assignor to Quinton Instrument Company, Seattle, Wash.

Filed Apr. 10, 1970, Ser. No. 27,287
Int. Cl. A63b *23/06*
U.S. Cl. 272—69 **11 Claims**



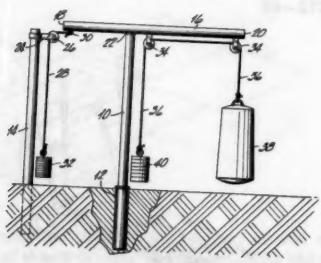
A simplified treadmill and belt support used for exercise purposes and for use as part of an ergometric system. An endless belt is driven over a support surface composed of a fabric such as canvas which is impregnated with wax. A suitable drive assembly causes continuous movement of the belt.

3,659,846
ELASTIC TYPE EXERCISING DEVICE
Walter J. Kanicki, 2011 Third St., Bay City, Mich.
Filed Oct. 29, 1970, Ser. No. 85,117
Int. Cl. A63b 23/04, 21/00
U.S. Cl. 272—80 11 Claims



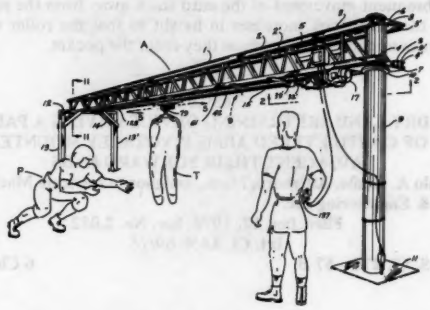
A modality construction comprising a pad having a core formed of yieldable material enclosed within an envelope or cover to one side of which is secured a pair of parallel, spaced apart, elastic mounting straps to enable the pad to be secured to any desired portion of a person's body. Between the mounting straps, and parallel thereto, is secured a non-elastic force transmitting strap having means at its opposite ends for connection to an anchor device which may be secured directly to an immovable object or, if preferred, secured to the immovable object through the intermediary of a spring.

3,659,847
FOOTBALL TACKLING AND BLOCKING TRAINING APPARATUS
Gordon James Gow, Barrie, Ontario, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed Oct. 1, 1970, Ser. No. 77,098
Int. Cl. A63b 67/00
U.S. Cl. 273—55 R 4 Claims



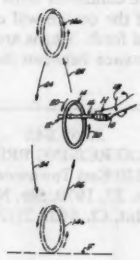
Apparatus for improving and training football players in blocking and tackling employing an elevated horizontal member rotatable in a horizontal plane about a point intermediate its ends. One end of the member is spring loaded and a counterbalanced tackling dummy hangs on pulleys below the opposite end of the member.

3,659,848
MOBILE TACKLING DUMMY
Thomas N. DePew, 10 N. Sunningdale Drive, St Louis County, Mo.
Filed June 11, 1969, Ser. No. 832,199
Int. Cl. A63b 67/00
U.S. Cl. 273—55 R 3 Claims



A mobile tackling dummy comprising an elongated overhead support for a track, a trolley adapted for reciprocal movement along said track, a tackling dummy suspended from said trolley for movement therewith, means for effecting detachment of said dummy from said trolley upon engagement of the dummy by an individual during usage, and means for controlling the movement of said trolley to allow for reciprocal travel of said dummy and for optional starting and stopping thereof during its course of movement.

3,659,849
BATON AND RING GAME
William D. Seymour, 1100 N.E. 160th St., Miami, Fla.
Filed Dec. 19, 1969, Ser. No. 886,653
Int. Cl. A63b 67/00
U.S. Cl. 273—96 B 3 Claims



A game, employing a baton and a ring, wherein one end of the baton is held firmly in one hand and the ring is placed over the baton adjacent the outwardly extending end and spun thereon by a rotary movement of the baton. By means of the proper manipulation of the baton, the ring can be launched up into the air and caught on the baton after being permitted to bounce on the floor, sidewalk, etc., or alternatively it may be caught directly out of the air. The normally outwardly extending position of the baton is preferably divided into a plurality of delineated portions having different number values and the ring may likewise be divided into a plurality of sections having different number values or distinctive colors.

3,659,850

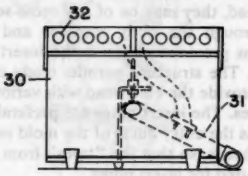
TABLE TENNIS PRACTICE OR GAME BOARD

Joseph A. Psenka, 4797 Stoneleigh, Bloomfield Hills, Mich.

Continuation of application Ser. No. 615,816, Feb. 13, 1967, now abandoned. This application Apr. 9, 1970, Ser. No. 27,125

Int. Cl. B63b *61/00*

U.S. Cl. 273—102.2 R 6 Claims



A game board for use on a table such as a table tennis table, the board being angularly adjustable to control the angle of bounce of a ball batted against the board. The board is also provided with indicia, openings for switch actuating devices to permit competitive games or games of skill in which a single player attempts to control the ball so as to hit indicia, pass through openings, or operate a switch. In the embodiments wherein the board has openings for passage of balls, a chute is provided for returning balls to the player.

3,659,851

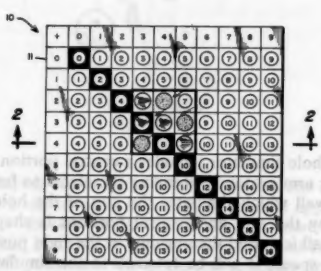
BOARD GAME APPARATUS

James W. Lang, and Emma P. Lang, both of P.O. Box 224, Mound, Minn.

Filed Aug. 25, 1970, Ser. No. 66,846

Int. Cl. A63f *3/00*

U.S. Cl. 273—130 B 2 Claims



A mathematical game board apparatus comprising game board means having horizontally and vertically disposed lines defining a playing area with a plurality of rows and columns of squares defined by said lines. Indicia means are provided in alignment with the rows and columns with each indicia representing a certain mathematical factor or addend, the square at each intersection of a row and a column containing a numeral which represents a result in which each corresponding mathematical factor or addend is an input function. A generally transparent block is provided, this block being adapted to cover an area three squares wide and three squares long, and a plurality of generally opaque tokens are provided, the individual tokens being adapted to be removably placed on the surface of the generally transparent block to conceal the indicia displayed upon the square disposed beneath the respective token. In use, the generally transparent block provides a playing field for tic-tac-toe.

3,659,852

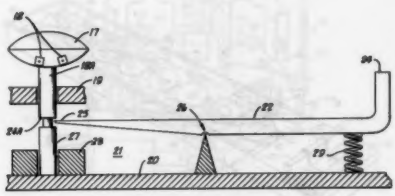
BOARD GAME APPARATUS

Donald E. Redict, 9433 South Champlain, Chicago, Ill.

Filed July 31, 1970, Ser. No. 60,041

Int. Cl. A63f *3/00*

U.S. Cl. 273—134 AD 6 Claims



A game of chance incorporating a game board and a number of playing pieces, the game also including a set of dice, a plurality of defense cards and offense cards as well as 36 playing blocks, the defense cards being supportable upon card holders. The game board has mounted thereon at the center thereof a dice display container which is vertically movable to shake the dice. Push buttons are provided on the game board at each of the players' locations for shaking the container.

3,659,853

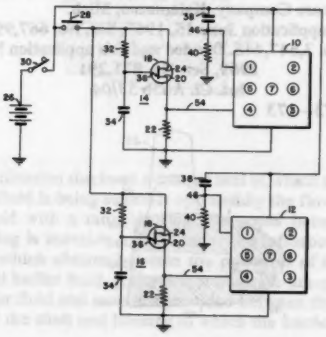
ELECTRONIC DICE GAME

Donald E. Church, Richmond, Ind., assignor to Avco Corporation, Richmond, Ind.

Filed Feb. 2, 1970, Ser. No. 7,591

Int. Cl. A63f *9/04*

U.S. Cl. 273—138 A 4 Claims



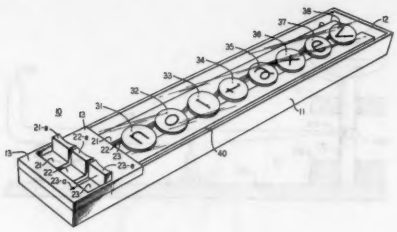
A dice game simulated by means of two banks of seven electric lamps each will when activated, by means of a power switch, show present numbers. Four of the lamps are positioned in the corners of a square plus two in the middle of opposite sides and one in the center. The lamps are connected in logic circuitry which when operated ramdomly illuminates the lamps in such a manner as to simulate, with equal probability, the six sides of a die. The circuitry includes a free-running unijunction oscillator having an output coupled to a six-position ring counter.

3,659,854

PUZZLE WITH CHANGEABLE INDICATOR WHEELS ARRANGED IN INTERRELATED GROUPS

Frank W. Sinden, 106 Maple Street, Summit, N.J.

Filed Jan. 8, 1970, Ser. No. 1,411
Int. Cl. A63f 9/08
U.S. Cl. 273—155 10 Claims



A mechanical puzzle employing interrelated, actuator controlled indicators. The puzzle is solved when the indicators have been moved to prescribed positions by the selective operation of the various actuators.

Each indicator is a kind of ratchet wheel, and each actuator is a slidable, multipawled ratchet bar that is associated with a group of ratchet wheels. A floating, spring-loaded detent bar is common to all of the indicator wheels.

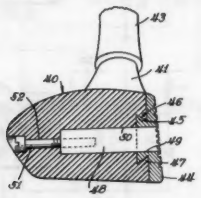
As each ratchet bar is moved translationally, its pawl portions engage the ratchet wheels of the associated group, and each wheel of the group is rotated a prescribed amount. The different rotational positions represent different states or settings of the ratchet wheels. The ratchet bars are operated individually or severally until all of the ratchet wheels have desired settings, and the puzzle is solved.

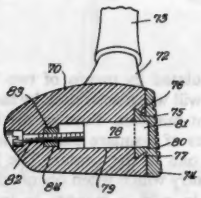
3,659,855

GOLF CLUB HEAD AND NOVEL METHOD OF PRODUCING SAME

Benjamin T. Hardesty, Fairlawn Village, Ohio, assignor to Shakespeare Company, Kalamazoo, Mich.

Original application June 15, 1967, Ser. No. 667,991, now Patent No. 3,547,445. Divided and this application Nov. 13, 1969, Ser. No. 871,291
Int. Cl. A63b 53/04
U.S. Cl. 273—173 7 Claims





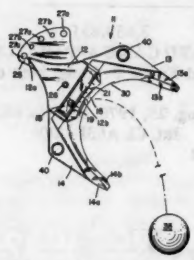
A plastic golf club head is formed in two major parts, a body member and a face plate. Complementary dove-tail members are provided on the body member and face plate so that the face plate may be founded by sliding it onto the body member. To prevent movement therebetween when in position, a plastic insert plug is inserted in channels provided in both the body member and face plate in mutual registry. One or more plugs and complementary channels may be utilized. The plugs may be of any desired cross-section. However, when only one plug is utilized, it should preferably have a non-circular cross-section such as rectangular to prevent rotational movement of the face plate. Where two or more plugs are utilized, they may be of any cross-section. A screw is inserted through the body member and engaged in a threaded means provided either in the insert plug or in the body member. The structure permits ready changing of the face plate to provide the club head with various striking contours and angles. The insert plugs are preferably of the same cross-section as the entry ducts of the mold used for molding of the plastic heads, so that the "trees" from molding of the heads may be used for insert plugs.

3,659,856

GOLF PUTTING PRACTICE DEVICE AND PUTTING AID

James I. Fatur, 6300 West 78th St., Los Angeles, Calif.

Filed Jan. 13, 1971, Ser. No. 106,055
Int. Cl. A63b 57/00
U.S. Cl. 273—177 R 12 Claims



A golf hole simulator includes a central portion with a pair of similar arm portions extending therefrom to form an open arcuate wall which simulates the cup of the hole. The wall formed by the arm and central portions is shaped so that when a ball is putted thereagainst at the right position and at the right speed, it will be retained in the simulated "hole", while putts made at too high a speed or striking the wall at the wrong position will not be retained. A slope indicator is provided to indicate the slope of the surface on which the device is placed for indoor or outdoor use. A gage is provided to be utilized in conjunction with the slope indicator to set the device at an angulated position with respect to the location of the ball to be putted, this position being indicative of the proper putting line to be used to compensate for the measured slope.

3,659,857

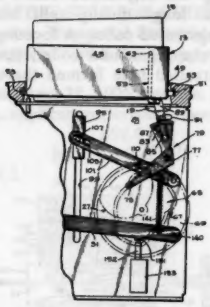
CASSETTE LOWERING AND RELEASE MECHANISM

Donald W. Marcinkus, Arlington Heights, Ill., assignor to Ampex Corporation, Redwood City, Calif.

Filed Nov. 10, 1969, Ser. No. 875,045
Int. Cl. G11b 23/12
U.S. Cl. 274—4 F 4 Claims

Cassettes are transported from a magazine to an operative position for playback or recording by a movable chassis which is smoothly and evenly driven by means including a

small motor to the operative position. The cassette is also held at the operative position, released for movement from



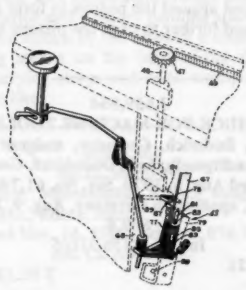
the operative position and returned to the magazine without jarring.

3,659,858

AUTOMATIC TERMINATION OF OPERATION OF A CASSETTE CHANGER

Glenn E. Sterly, Carol Stream, Ill., assignor to Ampex Corporation, Redwood City, Calif.

Filed Nov. 10, 1969, Ser. No. 875,046
Int. Cl. G11b *23/12*
U.S. Cl. 274—4 F **7 Claims**



After the playing of a cassette stored in the last one of a series of storage compartments of a cassette changer apparatus, the operation thereof is automatically terminated and operated manual controls or selectors are returned from on positions to off positions. The preferred selectors are push buttons which remain depressed in an on position until the playback or recording of the last cassette is terminated so that during the playing of the last cassette the actual mode of operation of the cassette recorder is correctly indicated to the user.

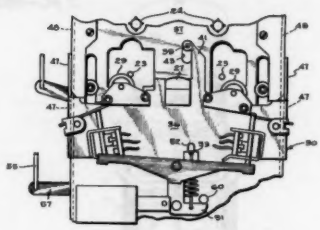
3,659,859

CASSETTE CHANGER WITH A PAUSE MODE

Donald W. Marcinkus, Arlington Heights, Ill., assignor to Ampex Corporation, Redwood City, Calif.

Filed Nov. 10, 1969, Ser. No. 875,259
Int. Cl. G11b *15/29*
U.S. Cl. 274—4 F **5 Claims**

By operating a pause selector for a cassette changer apparatus, the user may interrupt a playback from or recording onto a tape of a cassette and, after the interruption, resume playback or recording by return of the pause selector. The mechanism for achieving a pause includes a carrier for carrying a sound transducer head and tape drive components to and from an operative position with the tape and a pause position in which the sound transducer head and tape drive



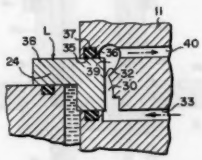
components are spaced from the tape. The carrier will be in the pause position unless a playback or recording operation is in process.

3,659,860

BARRIER SEAL WITH SELF REGULATING BUFFER

Heinz K. Muller, Neustadt, Germany, assignor to Sealol, Inc., Warwick, R.I.

Original application May 14, 1968, Ser. No. 728,950, now Patent No. 3,556,538, dated Jan. 19, 1971. Divided and this application June 8, 1970, Ser. No. 43,998
Claims priority, application Germany, June 3, 1969, M 74257
Int. Cl. F16j *15/40*
U.S. Cl. 277—59 **9 Claims**



This specification discloses a barrier seal in which the pressure of the fluid is being sealed is opposed by the flow rate of a buffer fluid with a movable ring interposed between the two. This ring is movable axially under the influence of the differential which obtains between the pressures of the sealing fluid and buffer fluid. Appropriate passages are provided for the buffer fluid and seals are provided between the movable ring and the shaft and housing in which the barrier seal is installed.

3,659,861

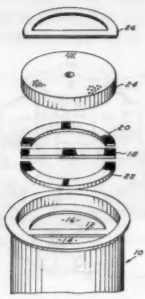
PARTICULATE COATING FOR THE RUBBING SEAL OF A GAS TURBINE REGENERATOR

Vemulapalli D. Rao, Woodhaven, and Yeshwant P. Telang, Grosse Ile, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed July 6, 1970, Ser. No. 52,309
Int. Cl. F16j *15/54*; C23c *11/16*
U.S. Cl. 277—96 **4 Claims**

Particles having a core of a glazing material such as calcium fluoride surrounded by a shell of a metal that oxidizes at operating temperature are sprayed on a substrate to form a

rubbing seal for a ceramic regenerator. The oxide of the metal forming these shells is non abradable to the ceramic



regenerator. During engine operation the shell oxidizes and wears to expose appropriate amounts of the glazing material.

3,659,862

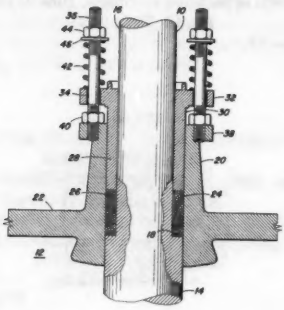
ROTATING SHAFT STUFFING BOX

Allison Sebestian, Albany, N.Y., assignor to GAF Corporation, New York, N.Y.

Filed July 29, 1970, Ser. No. 59,118

Int. Cl. F16j *15/18*

U.S. Cl. 277—106 **2 Claims**



The rotary shaft of a vacuum and pressure pump is provided with an annular flat shoulder located between sections of different diameters. A stationary cylinder contains the shaft, semi-solid packing material, and the cylindrical part of a spring-loaded gland which is also stationary. The cylindrical part of such gland presses the packing material at its inner annular end toward the flat shoulder on the rotary shaft to form a superior vacuum seal. The shoulder on the shaft is simply formed either by a machining operation, or by welding a collar on the shaft.

3,659,863

AUTOMATIC DRILL CHUCK AND SPLIT COLLET

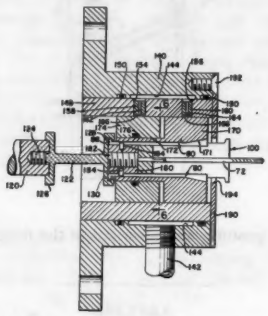
Horace J. Buttner, 1501 Palos Verdes Dr., North, Harbor City, Calif.

Filed Oct. 7, 1969, Ser. No. 864,395

Int. Cl. B23b *31/30*

U.S. Cl. 279—4 **24 Claims**

A fluid operated chuck includes drive means having an annular groove formed therein. A fluid actuated collet engaging means engages an associated collet. A novel segmented collet includes a plurality of separate spaced portions having a tapered outer surface which cooperates with a tapered surface on the collet engaging means. Each of these collet portions has a radially outwardly extending flange at the inner end thereof which fits within the annular groove in the drive means for retaining the segmented collet in position. A generally cylindrical longitudinally split inner collet fits snugly within the segmented collet. A locating ring can also be disposed within the segmented collet, this locating ring having a central threaded hole formed therein. Pin means



may also be provided between the collet portions for maintaining them in operative spaced relationship to one another. These pins can be carried by the drive means or the locating ring. A modified form of chuck includes a pair of pistons one of which is slidable upon the other, the pistons being movable in opposite directions to operate an associated collet. Fluid is introduced around the pistons to form a fluid bearing for the pistons and further to urge the pistons away from one another.

3,659,864

CHUCK FOR MACHINE TOOLS

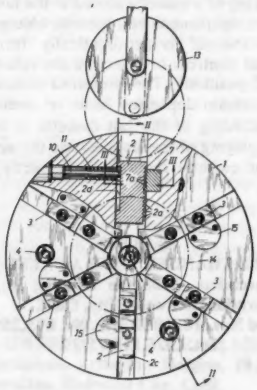
Johann Blattry, Buderich, Germany, assignor to Paul Forkardt Kommanditgesellschaft, Dusseldorf, Germany

Filed Aug. 6, 1970, Ser. No. 61,740

Claims priority, application Germany, Aug. 9, 1969, P 19 40 609.8

Int. Cl. B23b *31/16*

U.S. Cl. 279—121 **6 Claims**



A chuck for mounting on the spindle of a machine tool comprises a plurality of jaws movable radially by an axially movable plunger. The connexion between the jaws and the plunger can be disengaged so that the jaws can be moved

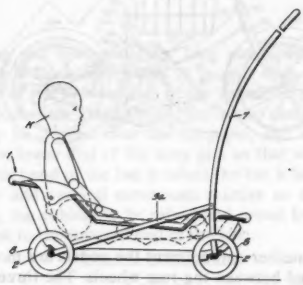
outwardly under the action of centrifugal force and inwardly under the action of a program-controlled thrust roller.

3,659,865

SAFETY SEAT FOR CHILDREN

Siegfried Nothacker, Wuppertal-Elberfeld, Germany, assignor to Gebr. Happich G.m.b.H., Wuppertal-Elberfeld, Germany

Filed Apr. 21, 1970, Ser. No. 30,489
Claims priority, application Germany, June 18, 1969, P 19 30 891.9
Int. Cl. B62b 7/12
U.S. Cl. 280—7.1 7 Claims



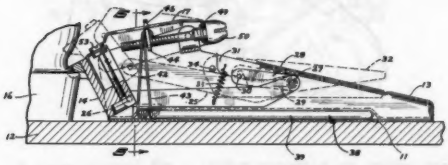
A child's safety seat including a trough like shell with an upholstered interior and a safety padding spanning the width of the shell to be struck by the head of a child if he falls forward; fastening means on the base of the shell permit attachment to carrying straps and belts, transport wheels, sled runners and the like.

3,659,866

HEEL BINDING

Paul S. Petersen, Minnetonka, Minn., assignor to Sports Technology, Inc., Edina, Minn.

Filed Nov. 14, 1969, Ser. No. 876,788
Int. Cl. A63c 9/00
U.S. Cl. 280—11.35 T 15 Claims



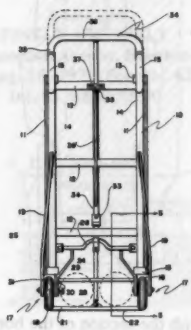
A release heel binding for use with skis and ski boots which utilizes a torsion bar type means for restraining the boot, permitting some upward movement of the heel, and means for positively releasing the ski boot after the heel has lifted a predetermined amount. The unit is adjustable so that the necessary force required to release the boot can be changed to make the binding usable across a wide range of operating conditions. The torsion bars provide for high energy storage to return the binding when lower than release loads have been encountered. The unit can be reset either by stepping into the binding, or by a manual reset movement of a lever.

3,659,867

FOLDABLE TOW-WHEEL DOLLY

Walter John Curry, 337 Roberta Street, Winnipeg 15, Manitoba, Canada

Filed Oct. 1, 1970, Ser. No. 77,099
Int. Cl. B02b 11/00
U.S. Cl. 280—36 C 3 Claims



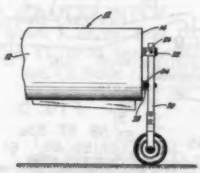
The handles are turned out and the wheels move from the stored position to the wheeling or operating position and vice versa. A bar is depressed which lowers the load plate and the bar also engaged studs on the wheel forks to lock the wheels open and the plate down.

3,659,868

DETACHABLE WHEELS FOR BOATS

Eura Tucker, Santa Ana, Calif., assignor to Dean Sandford, Orange, Calif., a part interest

Filed May 11, 1970, Ser. No. 36,319
Int. Cl. B62b 1/10
U.S. Cl. 280—47.32 11 Claims



A wheel assembly and mounting brackets for removably attaching the assembly to a boat is disclosed. An upper and a lower mounting bracket are permanently attached in vertically spaced relationship at each side of the boat. A wheel assembly is removably attached to each of the sets of brackets to provide mobile support for the boat on land. The wheel assemblies are normally detached while the boat is in the water.

3,659,869

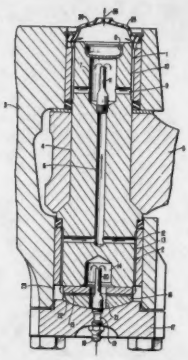
CONSTRUCTION OF A STEERING KNUCKLE BEARING FOR THE LUBRICATION BY MEANS OF LUBRICATING OIL

Helmut Hase, and Egbert Siwik, both of Gaggenau, Baden, Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Nov. 26, 1969, Ser. No. 880,150
Claims priority, application Germany, Nov. 27, 1968, P 18 11 092.4
Int. Cl. B62d 7/18
U.S. Cl. 280—96.1 19 Claims

An axle spindle bearing assembly which includes a lower and an upper bearing connected with each other by a bore

system provided in the axle spindle bolt while a reservoir space connected to the bore system is arranged in the axle spindle bolt within the area of the upper bearing which is in



communication with the section of the bore system leading to the lower bearing, for example, by way of a return checking device.

3,659,870

LEVELLING VALVE ASSEMBLY

Teiji Okuyama, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sept. 25, 1970, Ser. No. 75,517
Claims priority, application Japan, Sept. 26, 1969, 44/77252
Int. Cl. B60g *17/00*
U.S. Cl. 280—124 F **5 Claims**

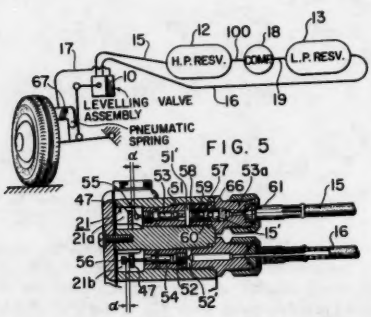


FIG. 5

The levelling valve assembly controls the supply and discharge of air to and from a pneumatic spring by providing a valve operating lever supporting shaft separate from the drive shaft for converting the sensed variations of chassis height into a corresponding rotational movement with a damper device resiliently connected therebetween.

3,659,871

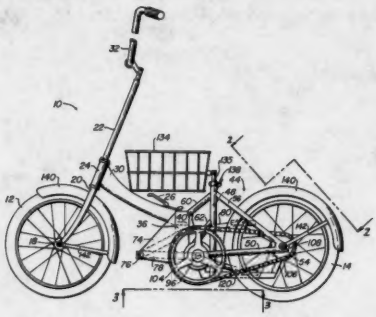
PEDAL OPERATED VEHICLE

Ion V. K. Hott, Dayton, Ohio, assignor to The Joyce-Cridland Company, Dayton, Ohio

Filed Mar. 23, 1970, Ser. No. 21,866
Int. Cl. B62m *1/06*
U.S. Cl. 280—221 **18 Claims**

The two rear wheels of a three-wheeled vehicle are mounted on spaced axles with foot pedal operated drives located therebetween. The operator stands on the pedals and powers the vehicle with a jogging motion.

In one embodiment the pedals are mounted on lever arms pivoted forwardly of the rear wheels and drive both the rear wheels with a minimum of lost motion through one-way



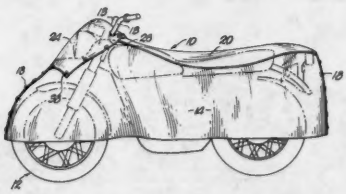
clutches. In another embodiment the pedals are mounted on a crank located between the rear wheels. The three-wheeled vehicles may be made primarily from standard bicycle parts. A seat may be mounted on a post between the front and rear wheels for movement about a generally vertical axis from a usable position to an out-of-the-way position.

3,659,872

FOLDABLE COVER STRUCTURE FOR MOTORCYCLE

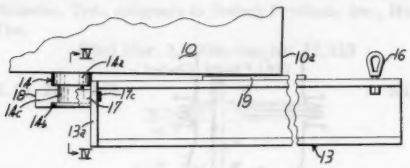
Leroy Warner, Box 109, Independence, Mo.

Filed June 26, 1970, Ser. No. 50,107
Int. Cl. B62j *19/00*
U.S. Cl. 280—289 **4 Claims**



A protective cover for a two-wheeled cycle having a pair of handlebars includes a pair of flexible panels which surround and overlie the cycle. An opening in one of the panels receives the handlebars, and a third flexible panel closes this opening. The third panel has first and second sections which present slits for receiving the individual bars of the pair of handlebars, and means on each section is provided for securing each section in close surrounding relationship to a respective handlebar. A plurality of fasteners around the periphery of the third panel secure the latter to the first and second panels and additional fasteners are provided at the front and rear of the cycle for securing the vertical side portions of that panel which surrounds the cycle.

3,659,873
LIFTING AND TOWING BAR FOR KING PIN EQUIPPED VEHICLES
Richard W. Gewalt, Route 2, Box 267, Attalla, Ala.
Filed Sept. 9, 1970, Ser. No. 70,685
Int. Cl. B60d 1/14
U.S. Cl. 280—415 A **3 Claims**



A lifting and towing bar for king pin equipped vehicles comprising a bar long enough to project from the king pin outwardly of the forward end of the vehicle, together with a king pin connector at the rear of the bar so designed that the same may be slipped over the king pin, and with seats to receive the lower end of the king pin, so that when in place and the front end of the bar is raised the bar is locked against horizontal and vertical movement relative to the king pin, permitting the vehicle to be raised and towed by attaching a lifting hook to the forward end of the bar

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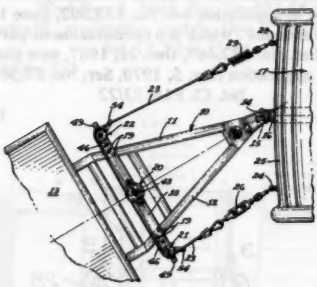
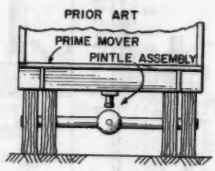
3,659,874
SWAY CONTROL FOR TRAILER HITCH
William L. Rendessy, 1839 East Moreland, Phoenix, Ariz.
Continuation-in-part of application Ser. No. 638,412, May 15, 1967, now abandoned , and a continuation-in-part of 763,843, Sept. 30, 1968, now abandoned. This application Jan. 16, 1969, Ser. No. 805,924
Int. Cl. B60d 7/00
U.S. Cl. 280—446 **13 Claims**



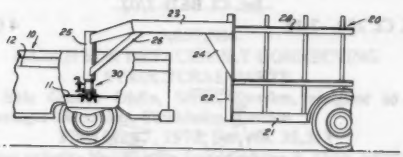
A sway control for a trailer mounted on trailer tongue between the trailer and the towing vehicle utilizing cable means and a drum friction clutch utilizing pivotal means for interconnection between the vehicles. In combination with the clutch, the invention comprises idler pulleys spaced from said clutch and over which cables of the invention project, and means for releasably pivoting at least one of the pulleys to slack the cable in order to permit detachment of the ends of the cable from added structure to the towing vehicle; said invention also comprising novel details of the drum and the manner in which the opposite portions of the cables are substantially contiguous with each other at the periphery of the drum and extending in opposite directions toward the idler pulleys; said opposite portions of said cable wound helically around said drum in opposite directions and toward opposite ends of said drum from a location of said cable portions where they are contiguous with each other such that said opposite portions may reciprocate with each other and always be very close to axial alignment with each other as they extend in opposite directions to said idler pulleys. Said idler pulleys are positioned on a mounting bar or brackets so as to be in close vertical alignment with the cables as they extend outwardly at the point where they are contiguous.

3,659,875
PINTLE ASSEMBLY
Joseph M. Masar, Boonton Avenue, Boonton-Taylortown, N.J.
Filed Aug. 10, 1970, Ser. No. 62,253
Int. Cl. B62d 53/00
U.S. Cl. 280—477 **7 Claims**



For a trailer coupling hitch, this assembly, in combination with a wheeled prime mover, presents a pivotal platform from which the pintle extends. The pivotability of the platform facilitates incident rising and lowering of the prime mover, as it traverses uneven ground, without causing a trailer coupled thereto to follow every excursion in elevation, and thus avoids the introduction of inordinate tensional and shear forces on the coupling pintle.

3,659,876
TRAILER HITCH
Johnnie D. Melton, Route 1, Barry, Tex.
Filed Dec. 11, 1970, Ser. No. 97,247
Int. Cl. B60c 1/06
U.S. Cl. 280—511 **10 Claims**



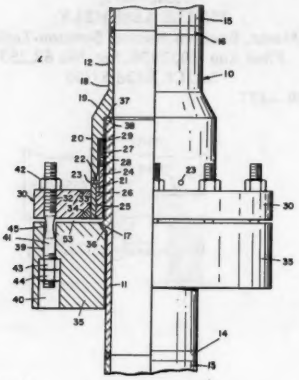
A trailer socket assembly for coupling to an upstanding shank mounted ball of a towing vehicle includes an upstanding cylindrical socket body having a downward opening cylindrical recess for receiving the ball and shank. The body is provided with slots in a transverse plane adjacent to the lower end which open to the socket recess from opposite sides of the body. A pair of elongated locking arms pivotally mounted on the body are swingable into the slots to define a restriction of the socket opening to retain the ball therein. A spring biased locking bar movable transverse to the plane of the locking arms includes recesses for confining the arms against lateral outward movement to release the ball. The socket body is adapted to define a downward extension of a vertical tubular member of a gooseneck drawbar.

3,659,877

BREAKAWAY PIPE COUPLING

James W. Kubasta, Metairie, La., assignor to Shell Oil Company, New York, N.Y.

Filed Sept. 11, 1970, Ser. No. 71,528
Int. Cl. F16l 35/00
U.S. Cl. 285—3 9 Claims



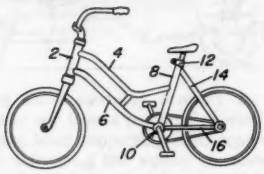
A breakaway pipe coupling for coupling a pipeline together comprising a pair of telescopingly engaged upper and lower tubular coupling members adapted to be connected to a pipeline and including a pair of flanges surrounding the members for holding them in fixed relationship, one flange being secured to the upper coupling member and a split flange surrounding but not secured to the lower coupling member. Frangible bolts secure the upper flange portion to the split flange with the split flange adapted to separate when undue stress is placed on the coupling members and breaks the frangible bolts.

3,659,878

ELEVATED CYCLE VEHICLE UTILIZING A CONVENTIONAL BICYCLE FRAME

Edward T. Carter, 1227 Olive St., Philadelphia, Pa.

Filed May 25, 1970, Ser. No. 40,051
Int. Cl. B62k 3/02
U.S. Cl. 280—7.15 4 Claims



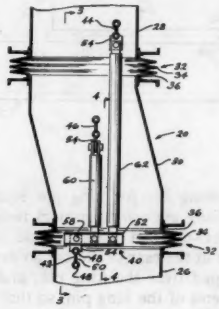
An elevated cycle vehicle is formed from a conventional bicycle frame, inverted from its normal position so that the center post previously used to support the bicycle seat extends downwardly from the sprocket bearing assembly. The contractable clamping means at the lower end of the center post receives a projection which is attached to horizontally oriented step means which assist a rider in boarding the vehicle. An elongated seat has a forward socket which receives a post extending upwardly from frame elements lying forwardly of the center post, while the rear portion of the seat is supported by posts connected to the frame elements lying rearwardly of the center post.

3,659,879

DUCT POSITIONER FOR THE CONTROL OF THERMAL EXPANSION

Gunter J. Stalph, Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed July 16, 1970, Ser. No. 55,464
Int. Cl. F16l 51/02
U.S. Cl. 285—114 6 Claims



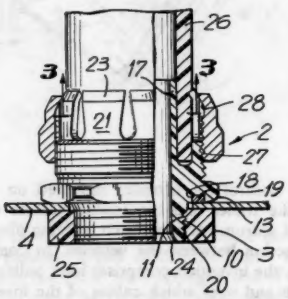
Described herein is a duct system for conducting heated fluids such as, for example, combustion gases from the interior of a vapor generator furnace, or the like. The duct system includes a toggle section connected to adjacent parts of the system by means of expansion joints thereby to accommodate relative displacements that will occur between the parts. Supporting structure for the toggle section is disclosed including lever mechanism so arranged as to control the extend of flexure in the respective expansion joints.

3,659,880

CONNECTOR FOR FLEXIBLE CONDUIT

Norman Goldsobel, 28 Bethal Lane, Commack, N.Y.

Continuation of application Ser. No. 833,502, June 16, 1969, now abandoned , which is a continuation-in-part of application Ser. No. 692,467, Dec. 21, 1967, now abandoned. This application Nov. 5, 1970, Ser. No. 87,308
Int. Cl. F16l 33/22
U.S. Cl. 285—161 10 Claims



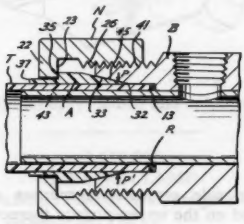
An electrical connector assembly is provided to connect flexible plastic conduit to an electrical fixture, such as an outlet box. The connector body includes a bottom tubular portion which protrudes through a hole in the fixture, a flange portion, and an upper portion. The upper portion includes a ferrule, an outer tubular extension which is castellated at its top and formed from a flexible elastic plastic resin. A compression nut forces the castellated top portion

against the conduit which bulges out between consecutive segments of the castellated portion and locks the connector on the conduit.

3,659,881
COUPLING CONNECTOR

Cleere B. Tinsley, and Edward K. Graham, Jr., both of Houston, Tex., assignors to Seabek Products, Inc., Houston, Tex.

Filed Mar. 2, 1970, Ser. No. 15,323
Int. Cl. F16l *33/00*
U.S. Cl. 285—249 **6 Claims**

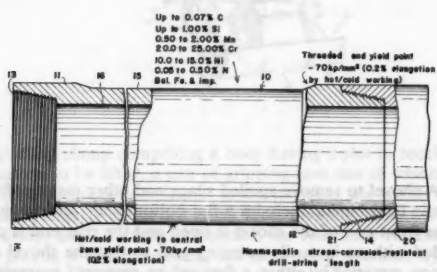


A coupling connector between a tube and a coupling body wherein an annular recess is formed in the coupling body to receive the tube, and wherein the tube is frictionally engaged and forced longitudinally against an annular seal located in the annular recess in the coupling body to form an effective pressure seal between the tube and the coupling body.

3,659,882
NONMAGNETIC CORROSION-RESISTANT DRILL STRING MEMBERS

Herbert Souresny, Ternitz, Austria, assignor to Schoeller-Bleckman Stahlwerke Aktiengesellschaft, Vienna, Austria

Filed Dec. 1, 1969, Ser. No. 881,154
Claims priority, application Austria, Dec. 2, 1968, A11685/68
Int. Cl. F16l *25/00*
U.S. Cl. 285—333 **2 Claims**

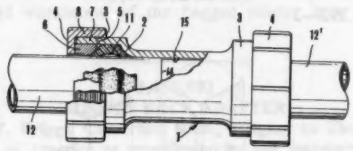


A drill string for deep-well drilling, coring and the like is composed of lengths unitarily formed of a nonmagnetic, high-nitrogen, chromium-nickel austenitic alloy steel and has a pair of threaded ends matingly engageable with the complementary ends of adjoining lengths and an intermediate or central portion between these ends. The drill-string members are composed of alloy steel containing from trace amounts to 0.07 per cent by weight carbon, trace amounts to 1.00 per cent by weight silicon, 0.50 to 2.00 per cent by weight manganese, 20.0 to 25.0 per cent by weight chromium, 10.0 to 15.0 per cent by weight nickel, 0.05 to 0.50 per cent by weight nitrogen and the balance iron and the usual impurities present in chromium-nickel alloy steels. The drill-string members are resistant to stress corrosion cracking and have their central zones worked (hot/cold working) to a yield point up to 70 kp/mm² (0.2 percent elongation) while the threaded end portions are hot/cold worked to a yield point above the minimum of (0.2 percent elongation) 70 kp/mm².

3,659,883
COUPLING CONSTRUCTION AND IMPROVED PACKING RING THEREFOR

Noriatsu Kojima, Yanagishima-cho 5-chome No. 31, Nakagawa-ku, Nagoya, Japan

Filed Nov. 12, 1970, Ser. No. 88,695
Claims priority, application Japan, May 26, 1970, 45/43043
Int. Cl. F16l *17/00*
U.S. Cl. 285—348 **1 Claim**

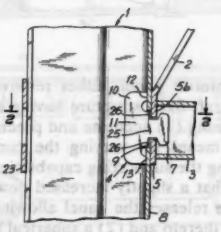


A coupling construction includes a coupling sleeve fitted over two pipe ends which are to be joined together and which includes a widened end portion at each end for accommodating a packing between the sleeve and a associated pipe and an intermediate portion which is of substantially the same diameter as the diameter of the pipe to be connected. The coupling joint is formed by a packing ring placed within the widened diameter sleeve portion and which is stressed and tightened by a ring member having a surface which bears against a concave surface of the packing ring when a threaded nut is tightened to the coupling sleeve and is displaced axially by the tightening. The packing ring includes an interior surface having an internal groove and includes a concave shoulder at each end on its exterior. One external concave shoulder presses against a convex interior portion of the coupling sleeve and the other shoulder on the opposite end is engaged by a ring member which is displaced axially during tightening. When the joint is fully tightened the packing ring is deformed so that the groove area is reduced to force out the air in the groove and to effect a tight engagement of the ring with the associated pipe.

3,659,884
LATCH FOR DETACHABLY CONNECTING STRUCTURAL PARTS

Bror Eric Gustav Ohlin, Saffle, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

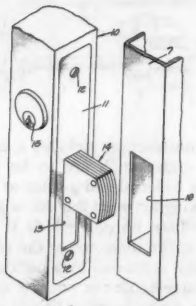
Filed May 7, 1970, Ser. No. 35,311
Claims priority, application Sweden, May 9, 1969, 6595/69
Int. Cl. F16b *3/00*, *7/22*
U.S. Cl. 287—189.36R **5 Claims**



A pair of structural parts having walls formed with elongated slots of generally similar shape are detachably con-

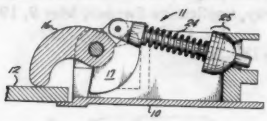
nected by a latch including a body and a catch separated therefrom by a connecting neck portion. When the walls of the parts overlie one another and the openings therethrough are in alignment and coincide, the latch is in an operative position after the catch has been moved through both of the openings in the parts and a projecting wall section of the body has been moved into the opening of one part. When in such operative position the latch functions to detachably connect the parts after they have been moved relative to one another through an angle of 90°.

3,659,885
MAXIMUM SECURITY LOCK BOLT
Billie G. Nall, La Crescenta, Calif., assignor to Adams Rite Manufacturing Company, Glendale, Calif.
Filed Aug. 31, 1970, Ser. No. 68,314
Int. Cl. E05b *15/16*
U.S. Cl. 292—2 **9 Claims**



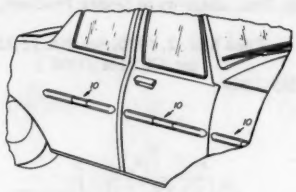
A maximum security lock bolt of composite construction which captivates an insert of a material which is substantially impervious to machining operations, such as a ceramic material, the insert being of a size sufficient to span or bridge the gap between the locked door and strike plate mounted on the associated door jamb.

3,659,886
AIRCRAFT PANELS WITH PRECISELY ADJUSTABLE AND EASY ACTION SPRING TOGGLE LATCH
Weldon R. Andrews, Seattle, Wash., assignor to Sealth Aero Marine Company, Seattle, Wash.
Filed May 1, 1970, Ser. No. 33,958
Int. Cl. E05c *19/02*
U.S. Cl. 292—78 **2 Claims**



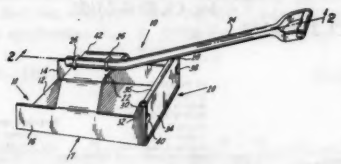
An aircraft interior panel, either removable or pivotally mounted in aircraft fixed structure having a new spring toggle latch comprising (1) accurate and precise spring tension, shim adjusting means for varying the compression of the spring for varying the supporting capabilities or forces of the panel latch so that a slightly increased downward, outward, or upward force releases the panel allowing it to swing out for accessibility thereto and (2) a spherical bearing means on the end of a toggle arm of the spring latch for ensuring a reliable, constant resistance, and an easy action in both locking and unlocking of the spring toggle latch.

3,659,887
DETACHABLE PROTECTOR FOR STEEL BODIES
Russell C. Marquette, 2423 East 15th St. Apt. A, Tulsa, Okla.
Filed Nov. 5, 1969, Ser. No. 874,115
Int. Cl. B60r *19/08*
U.S. Cl. 293—1 **2 Claims**



A detachable side protector comprises a base having slidably received on the upper surface thereof and magnetically held thereto two extension strips projecting horizontally therefrom in opposite directions. The protector is magnetically held on the exterior surface of a steel body to prevent damage thereto during the opening of doors on neighboring vehicles.

3,659,888
FEED BUNK SHOVEL
Melvin E. Dreier, Dumont, Iowa
Filed Oct. 3, 1969, Ser. No. 863,528
Int. Cl. A01b *1/02*
U.S. Cl. 294—49 **6 Claims**

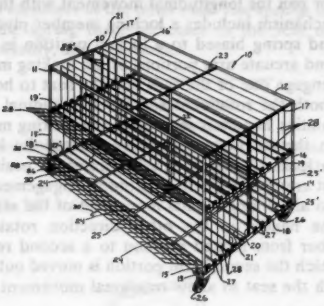


A shovel to remove spoiled silage and other material from cattle feed bunks. Includes a flat bottom with vertical sides. The front end of the shovel is open and the rear end is provided with an inwardly swinging gate so that the shovel can scoop material in either a forward or rearward movement. The gate swings closed when the shovel is lifted for unloading to keep the material from sliding off of the rear. A suitable handle is attached to an arched support between the sides so as to be sufficiently elevated for manipulation from a point outside of the sideboards of the feed bunk.

3,659,889
RACK
Andrew Whitley, Route 2, Box 72, Zebulon, N.C.
Filed June 25, 1970, Ser. No. 49,600
Int. Cl. A24b *1/06*
U.S. Cl. 294—5.5 **7 Claims**

In abstract, a preferred embodiment of this invention is an

improved rack for supporting tobacco during the curing process thereof, including a plurality of mesh separating partitions which fold for easy loading and unloading.

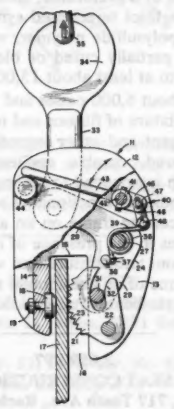


3,659,890

LIFTING CLAMP

Raymond L. Renfroe, Prescott, Ark., assignor to J. C. Renfroe & Sons, Inc., Jacksonville, Fla.

Filed Aug. 5, 1970, Ser. No. 61,074
Int. Cl. B66c *1/48*
U.S. Cl. 294—104 **2 Claims**



A lifting clamp comprising a body having a slot to receive an article to be lifted, a pair of gripping jaws one of which is movable, a linkage connected to the movable jaw which includes a shackle and a bell crank lever pivotally mounted in the body, and a locking mechanism for resiliently retaining the jaws in a closed position, the lock being operated by a handle lever located outside of the clamp body and movable downwardly toward the slot to a locked position and upwardly and outwardly away from the slot to an unlocked position.

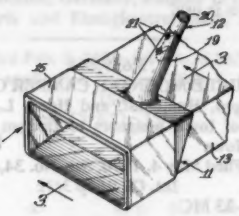
3,659,891

REFUSE COLLECTING DEVICE

Armando U. Pettenon, 12635 South Eggleston Ave., Chicago, Ill., and Edward M. Gorski, 15257 Ingleside Ave., Chicago, Ill.

Filed Dec. 11, 1970, Ser. No. 97,135
Int. Cl. A47f *13/06*
U.S. Cl. 294—19 R **10 Claims**

A refuse collecting device having an improved tubular bag-mounting member at the lower end of a handle for collecting refuse such as animal leavings and the like. The refuse is collected in a disposable bag removably mounted on the tubular element in an improved manner for positive association with the tubular element during use while yet providing for facilitated withdrawal of the bagged matter in a sanitary manner.

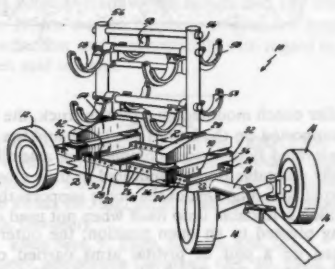


3,659,892

MISSILE RACK ADAPTER

Robert F. Briggs, Camarillo, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed June 29, 1970, Ser. No. 50,773
Int. Cl. B60p *3/00*
U.S. Cl. 296—3 **8 Claims**



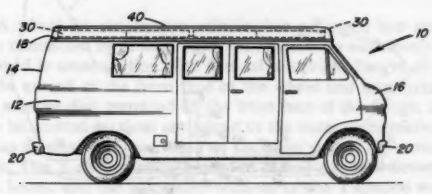
An adapter member for rendering a cluster-type missile rack supportable on storage brackets or on missile transport vehicles having a variety of differently arranged load bearing surfaces. Each adapter has on its undersurface at least two spaced support contacting surfaces, and includes means to lock the adapter to its support. Shock absorbing vibration isolaters are incorporated into the design.

3,659,893

CAMPER VEHICLE

Byron D. Steele, 1119 Tiffany Rd., Silver Spring, Md.

Filed June 22, 1970, Ser. No. 48,207
Int. Cl. B60p *3/34*
U.S. Cl. 296—23 R **5 Claims**



A vehicle of the camper type having a vertically extendible top and a sleeping compartment with extensions to receive

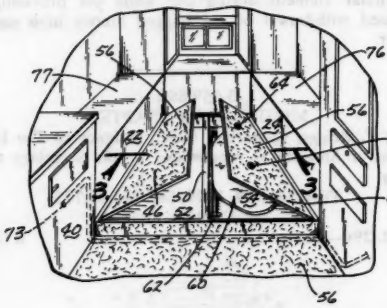
beds when the top is raised, thus providing standing room within the vehicle. Pneumatic jacks, supplied from an onboard air storage tank, are used for raising the top, and simple latches retain it in elevated position when the sleeping compartment is in use.

3,659,894

VEHICLE MOUNTED CAMPER COACH

John N. Dodgen, Humboldt, and Harry L. Taylor, Dakota City, both of Iowa, assignors to Dodgen Industries, Inc., Humboldt, Iowa

Filed May 4, 1970, Ser. No. 34,491
Int. Cl. B60p *3/32*
U.S. Cl. 296—23 MC **11 Claims**



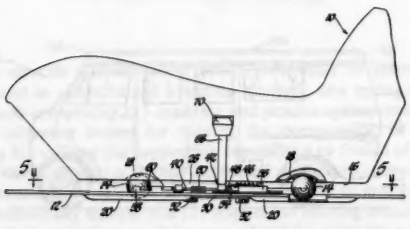
A trailer coach mounted on a pickup truck, the floor of the coach supported on the bed of the truck and the coach having an elevated floor over a compartment assessible through outwardly pivotable doors concealed in their closed position by a carpet covering. One of the doors supports the posts of a table which is foldable unto itself when not used or extended by being pivoted to an open position, the outer half being supported on a pair of pivotal arms carried on the half secured to the posts. The table may be disassembled and stored in the compartment and oppositely disposed ledges over the walls of the truck bed may be extended over the elevated floor and provide double sleeping area while leaving space to pass therebetween. The water lines for the appliances in the camper may extend through the compartment which functions as an insulating chamber protecting the water lines from the freezing outside temperatures.

3,659,895

SWIVEL SEAT LOCKING MECHANISM

Du Wayne D. Dresden, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 10, 1970, Ser. No. 62,296
Int. Cl. B60a *1/08*
U.S. Cl. 296—65 R **4 Claims**



A vehicle seat is mounted on a vehicle floor pan for both rotational movement about a vertical axis and longitudinal movement with respect to the vehicle. A pair of floor pan mounted longitudinally extending rails slidably mount a carrier on the floor pan for longitudinal movement with the seat. A locking mechanism includes a locking member pivoted to the carrier and spring biased to a locked position in which first and second arcuate arm portions of the locking member respectively engage one of the rails and the seat to hold the seat against both the rotational and the longitudinal movement. An actuating handle is secured to the locking member and actuation thereof in one direction rotates the locking member from locked position to a first released position in which the first arm portion is moved out of engagement with the one rail to allow longitudinal movement of the seat. Actuation of the handle in the other direction rotates the locking member from locked position to a second released position in which the second arm portion is moved out of engagement with the seat to allow rotational movement of the seat.

3,659,896

ADHESIVE SEMI-CURED SEALING STRIP FOR AUTOMOBILE WINDSHIELD

Daniel J. Smith, Washington Crossing, Pa.; Earl H. Sorg, Trenton, N.J.; Elmer V. O'Grady, Yardley, and Fred Walters, Levittown, both of Pa., assignors to Thiokol Chemical Corporation, Bristol, Pa.

Filed Mar. 17, 1970, Ser. No. 20,206
Int. Cl. C08g *51/10, 51/08;* **B60q** *1/02*
U.S. Cl. 296—93 **12 Claims**

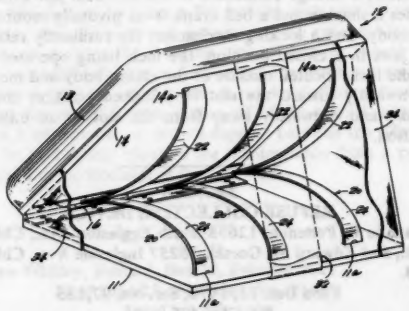
An automobile windshield mounting and sealing means is provided by means of a preformed, adhesive, curable sealing strip comprising a thiol terminated synthetic polymer, particularly a liquid polysulfide polymer, which has been made or modified, e.g. partially cured or blended to increase its molecular weight to at least about 13,000 and its viscosity at 25°C. to at least about 6,000 poises and which has been compounded with a mixture of fibrous and non-fibrous fillers, extenders, curing agent and other ingredients to form an extrudable, semi-cured, curable resilient polymeric sealing composition which is extruded to sealing strip form, which is substantially immediately functional as a windshield glass and the windshield receiving frame on an automobile body, and which further cures in the presence of atmospheric moisture under ambient room temperature and weather conditions in the windshield frame of an automobile to a moderately hard, strongly cohesive, resilient, strongly adhered sealing strip.

3,659,897

SEAT CONSTRUCTION

John Dale Wright, 717 Tenth Ave., Rochelle, Ill.

Filed Sept. 21, 1970, Ser. No. 73,945
Int. Cl. A47c *3/32*
U.S. Cl. 297—337 **5 Claims**



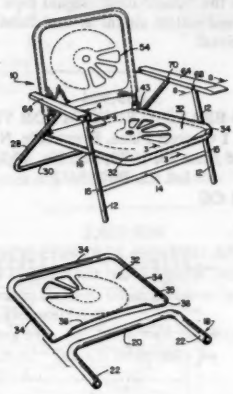
A seat member is hinged to a base member and a plurality of springs are located between the members to resiliently

urge them apart. Each spring is made of two counterposed leaf portions joined together at one end and secured to one of the members at the other end. The springs are arranged so that the spring force increases as the seat member moves downwardly, and vice versa.

3,659,898
CHAIR

Bernard Yellin, 5252 S. Kolman Ave., Chicago, Ill.

Filed Dec. 9, 1970, Ser. No. 96,316
Int. Cl. A47c *7/00, 3/00*
U.S. Cl. 297—445 **6 Claims**

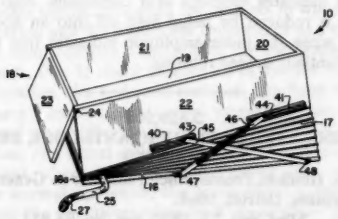


A chair characterized by a seat portion integrally molded of a plastic material and a back rest portion integrally molded of a plastic material, each readily attachable respectively to a seat frame and to a back frame of a chair.

3,659,899
DUMP SYSTEM

Ralph L. Phillips, 226 East 3rd South, Apt. #32, Salt Lake City, Utah, and John L. Ballou, 5891 South 75 West, Salt Lake City, Utah

Filed Mar. 12, 1970, Ser. No. 18,935
Int. Cl. B60p *1/16*
U.S. Cl. 298—22 R **10 Claims**

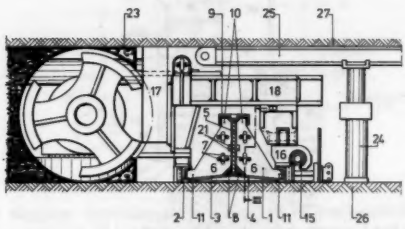


A dumping system wherein a pneumatic bag pivotally lifts a bed and the bag expansion results from use of vehicle exhaust. In a preferred form, a dumping unit is adapted to be placed on and removed from an existing truck bed to provide a dumping vehicle and in another preferred form the dumping bed pivot can be raised and lowered whereby items can be slid into or out of the dumping bed.

3,659,900
SCRAPER CONVEYOR GUIDING LONGWALL MACHINE

Otto Renzing, Bochum, Germany, assignor to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei mbH, Bochum, Germany

Filed Feb. 3, 1970, Ser. No. 8,283
Claims priority, application Germany, Feb. 4, 1969, G 69 04 184
Int. Cl. E21c *35/14*
U.S. Cl. 299—43 **9 Claims**

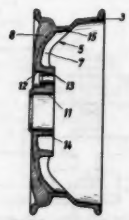


A scraper conveyor in which the entraining means, such as buckets or scrapers, are connected to endless circulating pulling means and move in grooves or troughs for conveying the material while the conveying trough and the trough for guiding the return section of the conveyor are located adjacent to each other and symmetrically with regard to a partition between said troughs.

3,659,901
WHEEL FOR AUTOMOTIVE VEHICLES

Ferdinand Anton Ernst Porsche, Stuttgart-Nord, and Ferdinand Alexander Porsche, Doffingen, both of Germany, assignors to Firma Dr.-Ing. h.c.F. Porsche KG, Stuttgart-Zuffenhausen, Germany

Filed Sept. 9, 1969, Ser. No. 856,381
Claims priority, application Germany, Oct. 10, 1968, P 18 02 298.5
Int. Cl. B60b *3/06*
U.S. Cl. 301—65 **5 Claims**

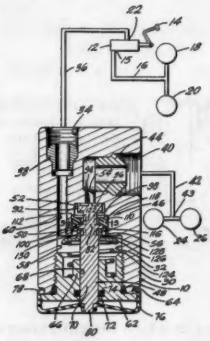


A wheel for automotive vehicles has a flanged hub and a rim connected by at least eight webs which are exclusively Y-shaped in cross-section. The vertical or upright flanges of the webs extend at the front face of the wheel and terminate at an annular disk provided on the front face of the flange, and the bifurcated sections are joined to the outer circumference of an annular body provided on the inner side of the annular disk. The Y-shaped webs extend in planes disposed between the bores, and the bifurcated sections of the Y-shaped webs diverge in the zone of the annular disk in a V-like manner toward each adjacent bore provided in the flanged hub. Additionally, the wheel is cast integrally from a light alloy.

3,659,902
PROPORTIONING VALVE

George R. Kish, Owosso, and Edward L. Volker, Swartz Creek, both of Mich., assignors to Midland-Ross Corporation, Cleveland, Ohio

Continuation-in-part of application Ser. No. 874,483, Nov. 6, 1969, now abandoned. This application July 15, 1970, Ser. No. 55,117
Int. Cl. B60t *8/26, 11/34*
U.S. Cl. 303—6 C 14 Claims

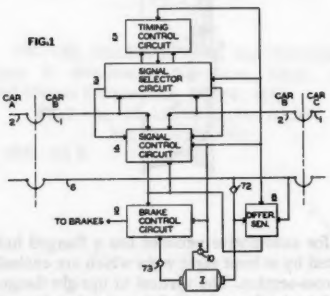


A proportioning valve for use in hydraulic brake systems of automotive vehicles, the proportioning valve being interposed between the master cylinder and the actuators of the rear brakes of the vehicle and incorporating improved means effective to establish a fluid pressure differential between the front and rear brake actuators in the higher ranges of fluid pressure applied by the master cylinder and to increase the pressure differential at a linear rate as the master cylinder pressure increases in such higher range.

3,659,903
POWER AND BRAKE CONTROL SYSTEM UTILIZING FLUIDIC LOGIC ELEMENTS

Ronald A. Sarbach, Columbus, Ohio, assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Sept. 29, 1970, Ser. No. 76,538
Int. Cl. B60t *13/70, 17/06, 11/26*
U.S. Cl. 303—20 19 Claims

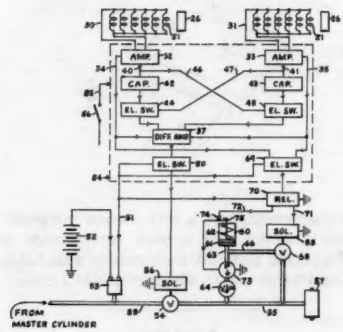


A fluidic signal control system is provided on each car of a railway train for controlling braking thereof in accordance with variation of fluid pressure in a signal pipe extending through the train. An interlock valve device intermediately positioned in the signal pipe separates the signal pipe into segments terminating at opposite ends of the car. Signal selector circuitry responsive to variation of fluid pressure in each signal pipe segment selects the segment in which the incoming signal is being received as the "controlling" segment and establishes the other segment as the "controlled" segment via which the outgoing signal is propagated irrespective of the direction from which the signal is received. The interlock valve device is positioned in accordance with digital pilot signals provided by the signal selector circuit to direct fluid pressure in the "controlling" signal pipe segment to a proportional amplifier means which reinforces the control signal locally for control of a brake control circuit on each car and for connection by the interlock valve to the "controlled" signal pipe segment for transmission to the next car. A timing control circuit is included to momentarily disable the portion of the signal selector circuit responsive to fluid pressure variation in the "controlled" signal pipe segment to assure that the transmitted signal is not falsely sensed as a signal being received.

3,659,904
NON-SKID BRAKING SYSTEM FOR VEHICLES

Fred C. Stevens, 1 Garrett Place, Bronxville, N.Y.

Filed June 23, 1970, Ser. No. 49,100
Int. Cl. B60t *8/12*
U.S. Cl. 303—21 CG 7 Claims



A series of electrical impulses is generated by a set of stationary coils and magnets rotating with the vehicle wheel and is fed to a differential amplifier in such a manner that the output is proportional to variations in amplitude of successive pulses. This output signal is used to interrupt the supply of brake fluid pressure to the wheel brake cylinder and thus prevent further build up of brake pressure when the pulse variation indicates incipient skid conditions. Also the fluid pressure is reduced by being bled off into an accumulator cylinder when the pulse amplitude indicates that the wheel has substantially ceased rotating.

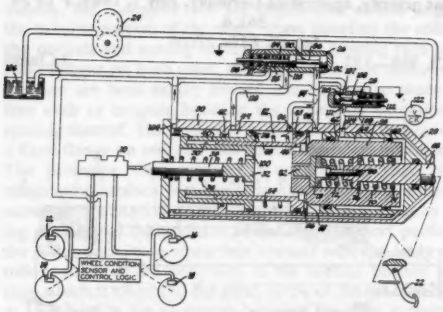
3,659,905
MODULATED HYDRAULIC ANTI-LOCK BRAKE BOOSTER

Joseph N. Goulish, Fenton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 23, 1970, Ser. No. 91,811
Int. Cl. B60t *8/06*
U.S. Cl. 303—21 F 3 Claims

An integrally housed open-center hydraulic brake booster and anti-lock modulator wherein a flow restriction induced back-pressure resulting from movement of a reaction piston into proximity with a manual piston forcibly moves a power piston to actuate the master cylinder. A control valve is shifted upon impending wheel lock to channel the back-pressure to the other side of the power piston to release the brake

pressure. The reaction piston, manual piston, and power piston are abuttingly engageable upon over-travel of the



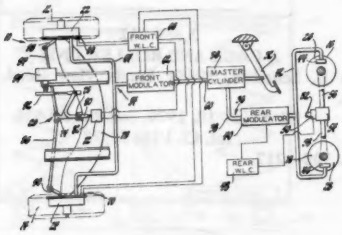
operator actuable pedal push rod to actuate the master cylinder independently of hydraulic booster fluid flow.

3,659,906

WHEEL LOCK CONTROL SYSTEM AND METHOD HAVING HIGH AND LOW MODE SELECTION

Robert A. Horvath, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 18, 1970, Ser. No. 12,199
Int. Cl. B60t *8/04*
U.S. Cl. 303—21 A **6 Claims**



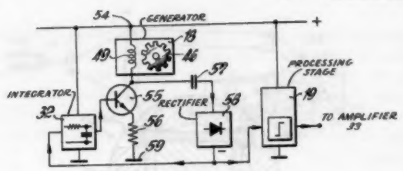
A vehicle wheel lock control system in which the front left and right wheels are provided with separate sensors. The sensors generate signals indicating the changes in wheel velocity during braking and the signals are transmitted to a controller, which, in turn, controls a modulator for the brakes of both front wheels. Due to slight differences in friction coefficient, brake operation, tire and road surfaces, one front wheel will usually have a larger instantaneous wheel slip than the other front wheel and will tend to lock more quickly than the other. Thus, one wheel will have signals generated indicating an incipient wheel lock condition earlier than the other wheel. In normal operation, the front wheel control system will actuate the modulator when both sensors have generated signals indicating the existence of a greater wheel slip than desired for optimum braking, but will not operate when only one wheel causes such a signal to be generated. Under some conditions of vehicle operation, and particularly when leftward or rightward steering is being attempted, the system is modified to cause the modulator to be operated when either of the front wheels causes such a signal to be generated, without also requiring a similar signal from the other wheel. The brake control system for the entire vehicle is also disclosed as including a rear wheel lock control system.

3,659,907

ARRANGEMENT FOR DETECTING SLIPPAGE OF WHEELS OF VEHICLES

Peter Gunsser, and Richard Zechnall, both of Stuttgart, assignors to Klaus Christ, Stuttgart-Durrlewand, all of, Germany and Robert Bosch GmbH, Stuttgart, Germany

Filed Dec. 4, 1969, Ser. No. 882,101
Claims priority, application Germany, Dec. 9, 1968, P 18 13 509.6
Int. Cl. B60t *8/08*
U.S. Cl. 303—21 CF **7 Claims**



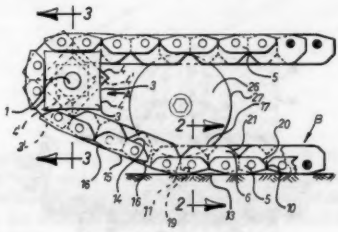
A slippage detecting system for use in conjunction with motor vehicles. Each wheel of the vehicle is provided with a transducer which supplies a voltage dependent upon the speed of the wheel. The transducer output is applied to a Schmitt-trigger circuit which becomes actuated when the voltage exceeds a predetermined value. Upon actuation of the Schmitt-trigger circuit, the braking system of the motor vehicle is operated through an amplifier, so that the braking force is regulated to prevent locking of the wheels. The transducer is in the form of a voltage generator with regulated excitation voltage. The voltage regulator includes an integrator and is connected between the output of the generator and the excitation winding thereof.

3,659,908

TRACK-ENGAGING ASSEMBLY

Edouard Martin Comellas, 154 du Golf Street, Loretteville, Province of Quebec, Canada

Filed Feb. 19, 1970, Ser. No. 12,766
Int. Cl. B62d *55/22*
U.S. Cl. 305—38 **11 Claims**



A track-engaging assembly more particularly used as a driving sprocket for an endless track of a caterpillar vehicle, comprising a plurality of parallel square elements mounted on a shaft or tubing with the side edges of the elements arranged at 45° with respect to the side edges of adjacent elements to engage an endless track made of a plurality of rows of interconnected substantially rigid elongated blocks with the blocks of one row displaced half a length of a block relative to the blocks of adjacent rows and wherein the plates are spaced from one another on the shaft or tubing, so that foreign material which may adhere to the track will not clog the sprocket, as it is free to fall between the elements.

The elements can be of similar or of different sizes in the latter case to engage and drive each block of each row when the blocks have different thicknesses, so as to obtain uniform pulling on the endless track across the width thereof.

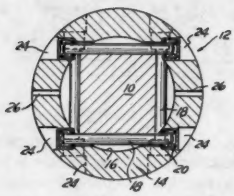
When the endless track system comprises vehicle supporting wheels running on the lower run of the track, said wheels preferably have a rim entirely made of metal in direct running engagement with the endless track blocks.

3,659,909

BEARING CONSTRUCTIONS

James Egbert, Verstand Engineering, Inc. 32371 Dequindre, Madison Heights, Mich.

Filed Oct. 26, 1970, Ser. No. 83,781
Int. Cl. F16c *19/00*
U.S. Cl. 308—6 R 1 Claim



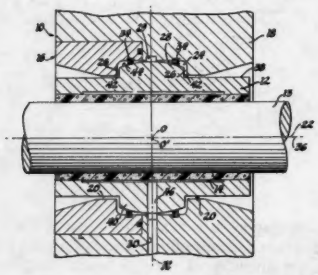
An anti friction bearing construction comprising a sleeve in which is telescoped a flat sided polygonal cross-section shaft; with longitudinally spaced rollers frictionlessly mounted in the sleeve and engaging the flat sides of the shaft.

3,659,910

RETAINER FOR SPHERICAL ADAPTER

David A. Foster, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed May 6, 1970, Ser. No. 35,167
Int. Cl. F16c *17/16, 23/04*
U.S. Cl. 308—9 1 Claim



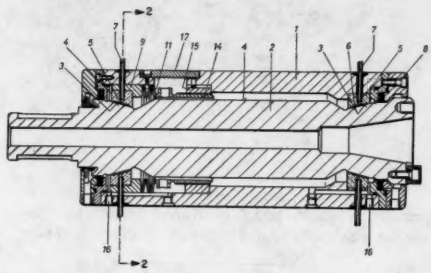
A self-aligning externally pressurized fluid film bearing is provided with a relatively deep grooved self-aligning seat. Critical dimensioning of portions of the seating groove and its cooperating partispherical bearing surface provide a means to insure centering of the bearing surface on the seat after assembly in order to provide adequate sealing of a fluid passage through the self-aligning elements, smooth self-alignment and resilient mounting of the fluid film bearing.

3,659,911

HYDROSTATIC PLAIN BEARINGS

Franz Kessler, and Karl Brand, both of Ebern, Germany, assignors to Kugelfischer George Schafer & Co., Schweinfurt, Germany

Filed July 6, 1970, Ser. No. 52,666
Claims priority, application Germany, July 7, 1969, P 19 34 361.4
Int. Cl. F16c *17/16*
U.S. Cl. 308—122 3 Claims



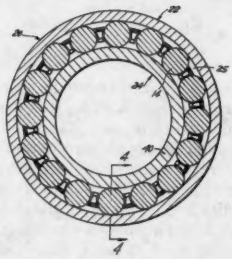
An arrangement of plain hydrostatic bearings for rotatably mounting a spindle in which the spindle is provided with a pair of tapered bearing surfaces symmetric to a plane perpendicular to the spindle's axis. Front and rear bearing boxes, each formed by several segments having lubricating oil pockets, are formed about the tapered bearing surfaces with the front box being rotatably and axially fixed and the rear box being rotatably fixed but axially movable to compensate for heat expansion.

3,659,912

A CAGE AND ROLLER UNIT

Hudson B. Scheifele, 30651 Ponds View Road, Franklin, Mich.

Filed Nov. 18, 1970, Ser. No. 90,636
Int. Cl. F16c *33/38*
U.S. Cl. 308—217 5 Claims



An annular sheet-metal roller-riding cage has a tubular portion with a multiplicity of circumferentially-spaced openings providing pockets for the rollers. Each opening or pocket has opposite cage-support surfaces disposed tangential to the roller mounted therein. The rollers are held in assembly by a corresponding number of L-shaped tabs, two for each roller, with arms extending radially from the tabular portion of the cage and located at the opposite ends of the roller. The free ends of the L-shaped tabs form tongues extending axially toward one another from the opposite sides of the tubular portion and are disposed at the opposite side of the pitch circle of the set of rollers from the tubular portion

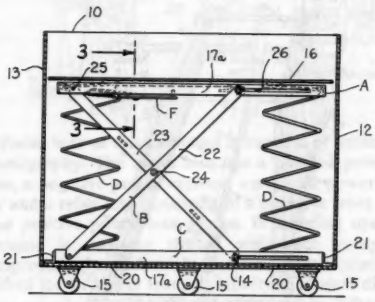
of the cage, thereby effecting retention of the rollers in the cage. The opposite sides of the tongues have surfaces converging toward the tubular portion. The tubular portion of the cage is positioned inward of the pitch circle of rollers seated in a two-flanged inner race, or outward of the pitch circle of rollers seated in a two-flanged outer race. Before assembly, the L-shaped tabs are disposed at obtuse angles to the tubular portion of the cage. Upon inserting the rollers in the pockets and seating them in a roller bearing race having fixed flanges on both sides, the opposite sets of roller-retaining tabs are bent axially toward one another to place their free ends or tongues between the rollers for retention and spacing thereof. This assembly is then mounted in a race with a fixed flange on one end and with a flangeless opposite end. The invention thus provides a roller-riding cage with a minimum clearance between it and the lowermost rollers yet accurately located in a radial direction. This is done by causing the normal flat surfaces of the cage support portion on the roller pockets to come into contact with the body of the rollers adjacent the periphery of the tubular portion of the cage which is closest to the pitch circle of the set of rollers so as to minimize the clearance between the cage support surface and the rollers for a given radial movement of the cage.

3,659,913

LOCK-DOWN MECHANISM

Linwood J. Waldron, Dover, and William J. Hastings, Rochester, both of N.H., assignors to Spaulding Fibre Company, Inc., North Rochester, N.H.

Filed Aug. 7, 1970, Ser. No. 62,103
Int. Cl. A47f *1/00*
U.S. Cl. 312—71 **4 Claims**



A lock-down mechanism for a floating platform for use in doff trucks and the like. The lock-down mechanism is carried adjacent the upper ends of a pair of lazy tongs so that its operation is not effected by lint and other foreign matter accumulated in the bottom of the doff truck. The lock-down mechanism includes a pivotal arm that is spring biased in an initial position. As the floating platform is lowered the pivotal arm is moved towards a keeper and engages an inclined notch therein. By lowering the floating platform further the pivotal arm passes around the keeper to its initial position allowing the platform to be raised.

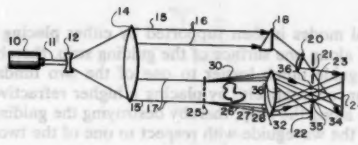
3,659,914

HOLOGRAPHIC SYSTEM WITHOUT LASER SPECKLE

Robert E. Brooks, Redondo Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Dec. 17, 1970, Ser. No. 98,978
Int. Cl. G02b *27/22*
U.S. Cl. 350—3.5 **20 Claims**

A holographic system particularly for holographic interferometry which minimizes the effect of laser speckle yet permits viewing of the holographic image over a wide angular range at discrete angles. The scene beam passes a periodic grating structure, such as a wire mesh screen, a phase grating, or an amplitude grating for breaking up the scene beam into a number of discrete beams corresponding to different orders. The subject is interposed between the grating structure and the hologram. A lens may be arranged between the subject and the hologram for focusing the various discrete scene beams so that a desired number may be selected by an aperture plate. Alternatively, a pair of mirrors may be used for bringing together the discrete scene beams created by the grating structure. A further refinement consists of a second



periodic grating structure disposed between the lens and the subject; again, the discrete scene beams may be focused by a lens. The two diffraction gratings preferably have different grating constants. Also, each of the discrete scene beams may be recorded on a separate hologram on which a reference beam is also directed. This may be effected by an additional periodic grating structure for also diffracting a discrete reference beam into the plane of each of the various holograms.

3,659,915

FUSED SILICA OPTICAL WAVEGUIDE

Robert D. Maurer, and Peter C. Schultz, both of Painted Post, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed May 11, 1970, Ser. No. 36,109
Int. Cl. G02b *5/14*; H01p *3/00*
U.S. Cl. 350—96 WG **10 Claims**

An optical waveguide having a high purity fused silica cladding layer, and a core of high plurality fused silica doped with a sufficient amount of a multivalent metal oxide so as to increase the index of refraction of the core above that of the cladding layer.

3,659,916

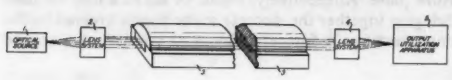
SINGLE-MODE DIELECTRIC WAVEGUIDE

Enrique Alfredo Jose Marcatili, Rumson, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of application Ser. No. 730,192, May 17, 1968, now abandoned. This application July 28, 1970, Ser. No. 59,014
Int. Cl. H01p *3/00*; G02b *5/14*
U.S. Cl. 350—96 WG **5 Claims**

This application describes a single-mode dielectric waveguide for guiding electromagnetic wave energy. The guide comprises a low-loss dielectric substrate in which a thin, low-loss, dielectric strip of higher refractive index is em-

bedded. In general, such a guide is capable of supporting a plurality of modes of two orthogonally-polarized families of modes. To limit the waveguide to single-mode operation, the cross-sectional dimensions are limited so that the guide is incapable of supporting modes higher than the fundamental mode of each of the two families of modes. One of two fundamental modes is then supported by either placing a lossy material along one surface of the guiding strip, thereby making the guide much lossier to one of the two fundamental modes or, alternatively, by placing a higher refractive index material along the strip, thereby destroying the guiding capability of the waveguide with respect to one of the two fundamental modes.



3,659,917

POCKELS CELLS

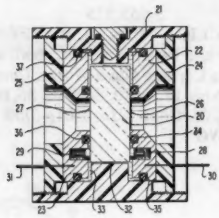
Jean-Louis Boutineau, Antony, France, assignor to Compagnie Generale D'Electricite, Paris, France

Filed Mar. 26, 1970, Ser. No. 22,831

Claims priority, application France, Mar. 28, 1969, 6909472

Int. Cl. G02f *1/34*

U.S. Cl. 350—160 **3 Claims**



An electro-optical cell, comprising an insulating case, having two windows arranged opposite to each other; a crystal in said insulating case; two insulating countercheeks, supported on the extreme faces of said crystal, by means of metallic electrodes, said countercheeks covering said windows in said insulating case, said electrodes and countercheeks having openings to allow the passage of light traversing the crystal;, and further characterized in that a sleeve, consisting of an insulating substance, is arranged around a lateral surface of said crystal and is in contact with said lateral surface and the interior surface of said case opposite said lateral surface, so as to insulate electrically said electrodes from each other is disclosed.

3,659,918

COLOR SEPARATING PRISM SYSTEM

Sing Liong Tan, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 24, 1970, Ser. No. 22,178

Int. Cl. G02b *5/28*

U.S. Cl. 350—166 **6 Claims**

A color separating prism system for a television camera including several dichroic layers arranged at angles of less than 30° to a plane normal to the optical axis, which layers are successively struck by the light rays which traverse the prism system, light within a given wavelength range being reflected at each respective layer. Such a color separating prism system increases the efficiency of the incident light and renders the response times of the three channels more equal to one another and to the lowest response time by providing at least one partially reflecting layer in the prism system in an airgap adjoining a dichroic layer.

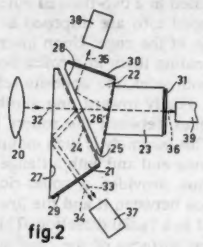


fig.2

3,659,919

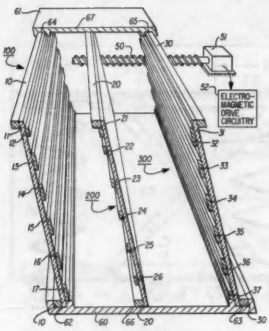
TRI-LEVEL INTERFEROMETER

Charles Sumner Williams, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 12, 1968, Ser. No. 783,337

Int. Cl. G02b *1/10*; G01b *9/02*

U.S. Cl. 350—166 **2 Claims**



Disclosed is an interferometer having three mutually parallel levels, each having a plurality of reflective stripes which divide light entering the interferometer into two groups of parallel beams to permit the phase difference between the beams to be determined by the position of the center level relative to the outer levels.

3,659,920

WIDE ANGLE INFINITY IMAGE VISUAL DISPLAY

Frank William McGlasson, Windsor, N.Y., assignor to The Singer Company, New York, N.Y.

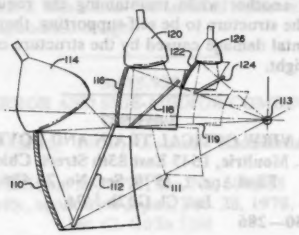
Filed Aug. 27, 1970, Ser. No. 67,385

Int. Cl. G02b *17/06, 27/14*

U.S. Cl. 350—174 **13 Claims**

A method of arranging a plurality of infinity image displays to form a wide angle display. Displays are shaped in the form of spherical wedges and butted together to form tiers having the desired horizontal field of view and the tiers arranged vertically to form a continuous vertical field of view. To avoid mechanical interference tiers may be segments of

spheres of different sizes and may still, if arranged so that the centers of all spheres of which tiers are segments are centered at the observer's eyepoint, provide a continuous display as seen by the observer.

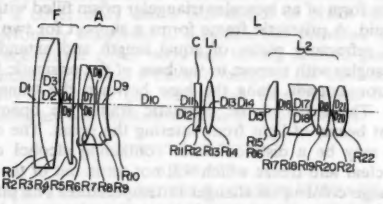


3,659,921

ZOOM LENS CAPABLE OF EXTREME CLOSEUP PHOTOGRAPHY

Ryusho Hirose, and Elichi Takano, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed July 23, 1970, Ser. No. 57,520
Claims priority, application Japan, July 26, 1969, 44/58743
Int. Cl. G02b *15/18*
U.S. Cl. 350—186 **5 Claims**



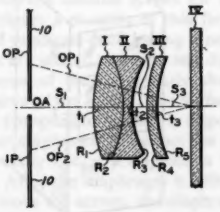
Zoom lens of this invention is capable of extreme closeup photography. The zoom lens has a positive power focusing lens, a negative power variator, a negative power compensator and a relay lens consisting of a movable front and a fixed rear positive power lens groups. In zooming operation, the variator is one-way shifted while the compensator is reciprocatingly shifted. In focusing, the focusing lens is shifted for an object from an infinity to a usual distance. For close-up photography the focusing lens is shifted to its extreme foremost end and the front group of the relay lens is shifted toward the image plane.

3,659,922

SYMMETRICAL HALF-LENS OPTICAL SYSTEM

George L. McCrobie, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 25, 1971, Ser. No. 118,745
Int. Cl. G02b *17/00*
U.S. Cl. 350—202 **1 Claim**



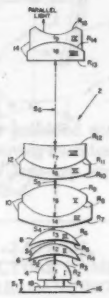
A two component Split-Dagor type lens is herein disclosed utilizing a reflecting surface at the stop position to reverse the light rays passing through the system thus simulating a conventional symmetrical Split-Dagor system.

3,659,923

SIX COMPONENT 100X MICROSCOPE OBJECTIVE

Arthur H. Shoemaker, East Aurora, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed Mar. 17, 1971, Ser. No. 125,080
Int. Cl. G02b *21/02*
U.S. Cl. 350—215 **2 Claims**



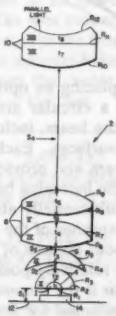
A six component achromatic oil immersion microscope objective having a magnification of 100X and a numerical aperture of 1.25.

3,659,924

FOUR MEMBER 100X MICROSCOPE OBJECTIVE

Arthur H. Shoemaker, Erie, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed Mar. 18, 1971, Ser. No. 125,623
Int. Cl. G02b *21/02*
U.S. Cl. 350—224 **2 Claims**



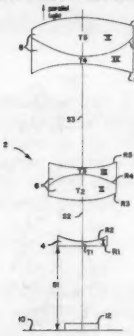
A four member achromatic oil immersion microscope objective having a numerical aperture of substantially 1.25 and a magnification of substantially 100X.

3,659,925

THREE COMPONENT 2.5X MICROSCOPE OBJECTIVE

Arthur H. Shoemaker, Erie, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed Mar. 24, 1971, Ser. No. 127,571
Int. Cl. G02b 21/02
U.S. Cl. 350—225 2 Claims



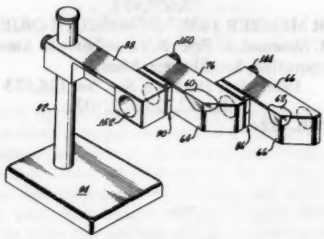
A three component achromatic microscope objective having a magnification of 2.5X and a numerical aperture of 0.07.

3,659,926

BEAM DISPLACER

Marcel L. Charbonneau, 890 S. Ponderosa, Orange, Calif.

Filed May 15, 1970, Ser. No. 37,526
Int. Cl. G02f 1/34
U.S. Cl. 350—285 7 Claims



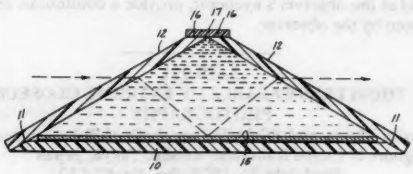
An apparatus for displacing an optical beam to a selected point anywhere within a circular area, providing extensive linear displacement of the beam, includes a plurality of pairs of parallel reflective surfaces. Each pair is arranged to receive an incoming beam and provide an exiting beam that is precisely parallel to the incoming beam. One of the pairs is mounted for rotation substantially about the axis of the incoming beam. At least another of the pairs is mounted to the first pair for rotation about the axis of the exiting beam of the first pairs. The two are relatively positioned so that the exiting beam of the first pair is the incoming beam of the second pair and the two are mounted for linear and rotational motion together along and about a vertical axis. The arrangement receives a light beam directed substantially horizontally to a first reflective surface of the first prism whereby the exiting beam from the second prism can be selectively positioned at any point within a circle lying in a substantially vertical plane. The various relatively movable parts are provided with clamped joints to maintain them in a selected relative position. The clamps normally provide a substantial friction force to lock one movable part with respect to another. A device is provided for opening the clamps a fixed amount to unlock the structure and allow one movable part to be rotated with respect to another while maintaining the required friction force for the structure to be self-supporting, thereby preventing accidental damage caused by the structure moving under its own weight.

3,659,927

REAR VIEW OPTICAL TRAIN AND DOVE PRISM

Charles W. Moultrie, 1543 East 85th Street, Chicago, Ill.

Filed Apr. 1, 1970, Ser. No. 24,486
Int. Cl. G02b 5/04
U.S. Cl. 350—286 11 Claims



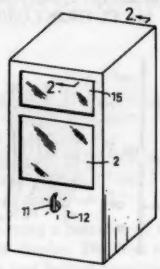
Dove prism particularly adapted for the optical trains of rear view vision devices. The prism is relatively large, to provide an adequate image in a rear view vision optical train and is in the form of an isosceles triangular prism filled with optical liquid. A prismatic frame forms a support for two transparent refractory plates of equal length and extending at equal angles with respect to the base of the prismatic frame. A mirror extends along the base between the transparent plates. The sides of the prismatic frame are opaque, to prevent beams of light from entering the prism. The optical liquid may be a distilled water containing alcohol or any other clear anti-freeze which will not settle out of the liquid or change color upon changes in temperature. The plates of the prism, refract beams of light to the mirror and in turn project the beams of light to a lens or mirror for viewing through a screen, which may be in the form of a ground glass screen.

3,659,928

REFLECTION APPARATUS FOR SIMULATING THE EFFECT OF USE BY A PERSON OF A COSMETIC OR ARTICLE

George Macfarlane, Chatswood, Australia, assignor to John Alan Davis, North Sydney, New South Wales, Australia

Filed May 11, 1970, Ser. No. 36,086
Claims priority, application Australia, May 12, 1969, 54887/69
Int. Cl. G02b 5/08
U.S. Cl. 350—291 4 Claims



An interiorly illuminated enclosure houses a changeable disc selectively movable to present one of a plurality of

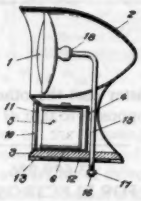
colors or shapes before an apertured chamber within the enclosure. Upon looking into the chamber through a see-through mirror a user views the selected color or shape superimposed upon their image.

3,659,929

BACK-MIRROR AND SIDE-MIRROR COMBINATION DEVICE

Masaharu Yuzawa, 10-23, 2-chome Kamiikedai, Tokyo, Japan

Filed Jan. 25, 1971, Ser. No. 109,365
Claims priority, application Japan, Feb. 28, 1970, 45/19294
Int. Cl. G02b 5/08
U.S. Cl. 350—307 2 Claims



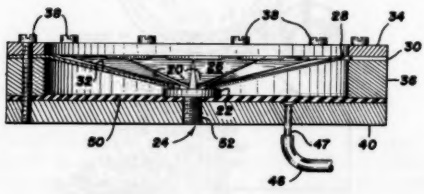
The device comprises a back mirror rotationally installed within a cover body and a side-mirror of prism reflection type pivotably supported in a square box provided beneath said back-mirror cover body and having colored glass window thereon to reflect a colored image of the sideward sight whereby the driver can distinguish therethrough between both sideward and backward sights without mistake.

3,659,930

SEGMENTED DEFLECTIBLE SCREEN SURFACE FOR TESTING EYES BY LASER REFRACTION

Horst E. Groneberg, Rochester, and Kenneth A. Snow, Greece, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Sept. 28, 1970, Ser. No. 76,046
Int. Cl. A61b 3/02; G02b 5/02
U.S. Cl. 351—36 4 Claims



A deflectible generally circular screen for testing eyes by laser refraction includes a plurality of thin flexible generally triangularly shaped segments each having a nonspecular surface. The segments are affixed to a base and disposed to have corresponding apexes of the triangularly shaped segments defining a central area of the screen. The surface of each segment opposite the nonspecular surface is disposed to engage an inflatable rubber diaphragm to deflect the triangular segments from a generally concave disposition to a generally planar disposition. After the diaphragm is inflated to engage and cooperatively move the screen, the diaphragm is deflated at a relatively slow controlled rate and a visual pattern formed on the nonspecular surfaces of the segments of the screen by a laser beam appears to move to an observer having abnormal eyesight.

3,659,931

EYE GLASS LENS ADJUSTER

Philip J. Allen, 6 Nelson Street, Fredericksburg, Va.

Filed Aug. 3, 1970, Ser. No. 60,397
Int. Cl. G02c 1/00
U.S. Cl. 351—41 4 Claims

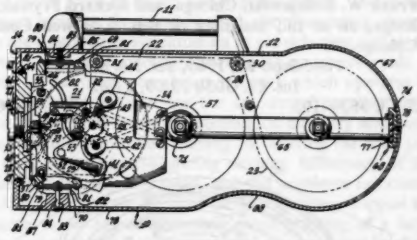
An eye glass frame is provided with manually adjustable means for individually moving each lens toward or away from the eyeball to vary the lens-eye separation for maximum comfort and optimum focus.

3,659,932

MOTION PICTURE CAMERA WITH COUNTERBALANCING MEANS

Walter H. Bach, 1771 North Crescent Heights Boulevard, Los Angeles, Calif.

Filed Oct. 5, 1970, Ser. No. 78,132
Int. Cl. G03b 17/02
U.S. Cl. 352—242 7 Claims



A camera having an elongated hollow case with a lens mount resiliently sealed in its front wall and supporting a zoom lens assembly. The lens mount is fastened to the front of a center plate supported in the front portion of the case on resilient mounts, and a counter-balancing lens stabilizer bar projects rearwardly from the center plate into a cushioned socket on the rear wall of the case.

3,659,933

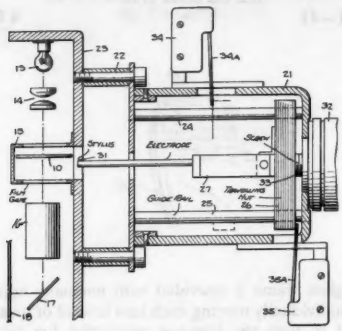
ANNOTATOR FOR MICROFILM READER

Harry Weitz, New Hyde Park, N.Y., assignor to Boxton-Beel, Inc., Brooklyn, N.Y.

Filed Aug. 11, 1970, Ser. No. 62,789
Int. Cl. G03b 21/00
U.S. Cl. 353—44 6 Claims

An annotator adapted to erase any selected line of text or a part of the line appearing on a reduced image formed on a microfilm strip of thermoplastic material which is transported within a microfilm reader for projection on a screen. The annotator includes a retractable carriage supporting a pair of electrodes whose ends are bridged by a resistance wire acting as a stylus. The carriage is movable by a stepping motor or other means to cause the stylus, whose length corresponds to the width of the frame, to advance incrementally across the film strip and in engagement therewith in a direction normal

to the direction of film travel. The stylus is arrested at a position in registration with a line of text to be erased, the stylus



and text being viewable on the screen whereby the registration may be readily checked. By electrically energizing the arrested stylus, the selected line is fused and erased.

3,659,934

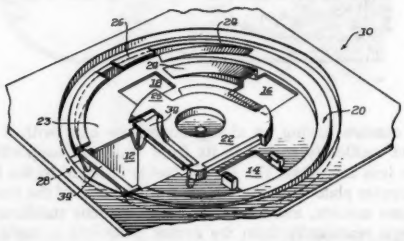
SLIDE TRANSPORT DEVICE

Carl C. Costanza, Chicago; Walter W. Weber, Des Plaines; Frank W. Betlejewski, Chicago, and Richard Frystak, Park Ridge, all of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Sept. 23, 1969, Ser. No. 860,384

Int. Cl. G03b *23/00, 23/02*

U.S. Cl. 353—103 **4 Claims**



A device for transporting slides in a horizontal plane to be projected by a slide projector.

3,659,935

COPYING METHOD AND APPARATUS

Roland Moraw, Wiesbaden-Biebrich, Germany, assignor to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

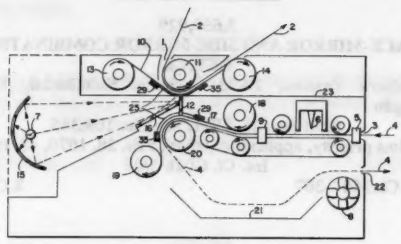
Filed Dec. 22, 1969, Ser. No. 886,889

Claims priority, application Germany, Dec. 23, 1968, P 18 16 591.8

Int. Cl. G03b *27/50, 27/54*

U.S. Cl. 355—1 **9 Claims**

This invention relates to a copying apparatus comprising a housing having therein a reflex exposure means, a bridge-like glass fiber optic, means for moving an optically clear spacing film together with copying material past one end of the fiber optic, and means for moving an optically clear spacing film



together with a master past the other end of the fiber optic and in a direction opposite to that of the copying material.

3,659,936

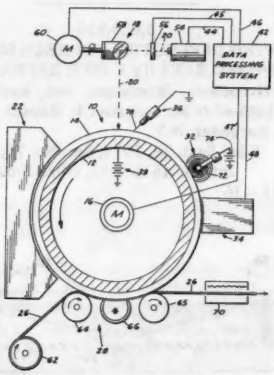
APPARATUS FOR ELECTROSTATIC PRINTING

Peter H. Klose, Troy, and Stanford R. Ovshinsky, Bloomfield, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Jan. 7, 1970, Ser. No. 1,265

Int. Cl. G03g *15/00*

U.S. Cl. 355—3 **17 Claims**



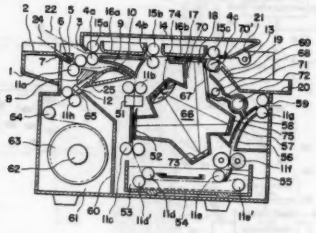
An electrostatic printer employs a metallic drum coated with a semiconductor film. The resistance of the film is varied from its high resistance or insulating state to its low resistance or conducting state in response to a scanning laser beam. A DC voltage source is connected to the metallic drum. The voltage is conducted through the semiconductor and appears at the surface in those regions where the laser beam impinges on the semiconductor. The semiconductor is then dusted with ink particles which cling to the regions where the voltage appears. Printing is accomplished by transferring the ink particles to a document. Multiple copies may be made by employing a semiconductor material exhibiting a memory characteristic.

3,659,937

SMALL SIZED ELECTRONIC DUPLICATOR

Yorio Yamanoi, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 28, 1970, Ser. No. 32,654
Claims priority, application Japan, Apr. 29, 1969, 44/39226
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 3 Claims



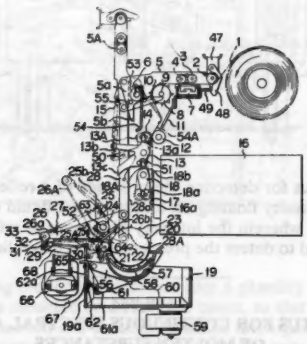
A cover body hinged to the housing of an electronic duplicator is rotatable between a first and second position so that in the first position a plurality of driven rollers within the cover body are aligned and in contact with a like plurality of driving rollers along an original document carrier path so that thin originals can be transported thereby and in the second position the driven rollers are located on the same level as the driving rollers and form an extension thereof so that thick originals can be transported along the carrier path.

3,659,938

INFORMATION RECORDING DEVICE

Sakae Fujimoto, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Apr. 28, 1969, Ser. No. 819,587
Claims priority, application Japan, Apr. 30, 1968, 43/29280; 43/29281; 43/35620; 43/35621; 43/35622; May 24, 1968, 43/35105
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 3 Claims



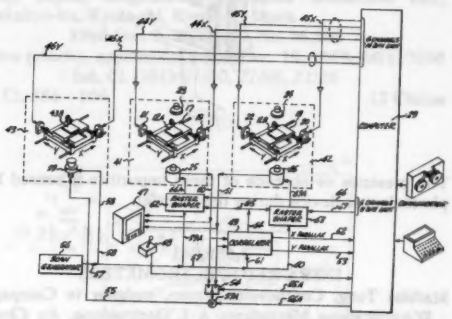
An electrostatic-photographic information recording device wherein a recording sheet is fed through an electrostatically charging section, an exposure section (photographing and recording section), a developing section and a drying section. The pressure rollers disposed in said sections and feed rollers are displaced by operation of one lever from the exterior of the device to the positions so as to open the path of feed of said recording sheet for loading the same in the device.

3,659,939

AUTOMATIC ORTHOPHOTO PRINTER

Gilbert L. Hobrough, Vancouver, B.C., Canada, assignor to Hobrough Limited, Vancouver, B.C., Canada

Filed Sept. 18, 1968, Ser. No. 760,435
Int. Cl. G01c *11/12*
U.S. Cl. 356—2 14 Claims



This application discloses an improved system which operates automatically to provide an orthophotograph from one or more pairs of stereo aerial photographs. The system disclosed includes first and second photo-scanning devices which are operated in synchronism to provide data signals for each spot of the two photographs making up a stereo pair. In addition to the usual correlation network which operates on the data signals to determine the amount of parallax error, the system includes image transformation circuitry and raster shaping circuits controlled thereby for altering the scan patterns of the two photo-scanning devices. Efficiency of the correlator is thereby improved, and the problems associated with changes in the elevation of the terrain being mapped are overcome to an extent such that patch printing of a large area is accomplished without the usual discrepancies in alignment of detail in adjacent patches. Details of the raster shaping system, the signal correlator providing the input signals for the raster shapers, and the signal analyzer of the correlator are provided along with a detailed description of the overall system.

3,659,940

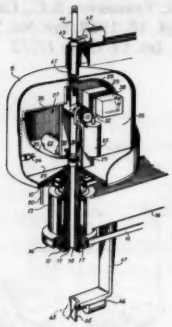
METHOD AND APPARATUS FOR EXAMINING LIQUID FILLED CONTAINERS

Knut Bonde Hansen, Malmo, and John Soren Petersson, Sodertalje, both of Sweden, assignors to Aktiebolaget Astra, Sodertalje, Sweden

Filed June 11, 1969, Ser. No. 832,187
Claims priority, application Sweden, June 11, 1969, 7825/68
Int. Cl. G01n *1/00, 15/02, 21/04*
U.S. Cl. 356—36 11 Claims

A container which is at least partially filled with a liquid is centrifuged while its longitudinal axis is maintained substantially perpendicular to its axis of rotation thereby causing impurities which may be present in the liquid to move to the end of the container farthest from the axis of rotation while the air bubbles in the liquid collect at the end of the container nearest to the axis of rotation. The container is then moved diametrically past the axis of rotation causing the air to move to the opposite end of the container. The centrifuging of the container continues causing any impurities which

may be present to be transferred from the end of the container in which they have been collected to the opposite end.



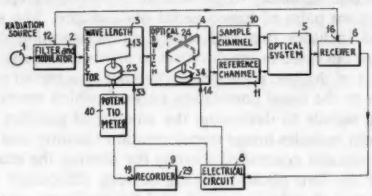
The presence or absence of these impurities is sensed by a photoelectric device during this transfer.

3,659,941

INFRA-RED SPECTROMETERS

Mathias Tong, Courbevoie, France, assignor to Compagnie D'Applications Mecaniques A L'Electronique, Au Cinema Et A L'Atomistique (C.A.M.E.C.A.)

Filed July 9, 1970, Ser. No. 53,516
Claims priority, application France, July 21, 1969, 6924739
Int. Cl. G01j *3/42*
U.S. Cl. 356—51 **5 Claims**



In a two-channel spectrometer, the output signal of the optico-electrical detector is integrated, while one of the two channels is illuminated, for a duration T_e at the end of which the integrated signals reaches a value E, one of the two values T_e and E being predetermined; the output signal of the detector is thereafter integrated, while the other channel is illuminated, for a duration T_1 at the end of which the integrated signal reaches the aforesaid value E; T_1/T_e is the transmission coefficient of the first channel relatively to the other one, and a signal function of T_1/T_e is applied to the recorder.

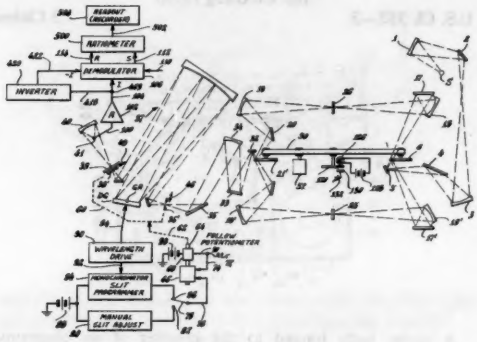
3,659,942

DETECTOR CIRCUITS FOR PHASE COMPENSATION

Joseph A. Vergato, Monroe, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Nov. 13, 1970, Ser. No. 89,166
Int. Cl. G01j *3/42*
U.S. Cl. 356—51 **12 Claims**

In double-beam optical testing instruments (e.g., spectrophotometers) in which a single radiation detector alternately receives radiation that has passed through two different optical paths, a separator or demodulator is utilized to separate the radiation detector electrical signal components into those representing the intensities of the radiation passing through each of the paths. The demodulator typically receives a synchronizing signal from the means causing the alternation of the two beams seen by the detector (typically one or more choppers having transparent and mirrored sectors). It has been found that when the size of the area of certain types of detectors receiving the radiation vary (caused, for example, by varying the entrance and exit slits of a monochromator in a spectrophotometer), the time lag in the



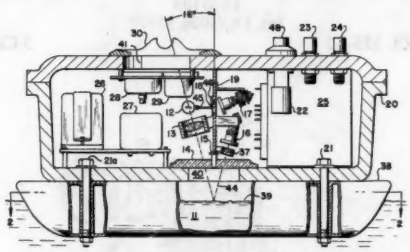
electrical output of the detector varies. The present device provides means for compensating the phase of the synchronizing demodulator signal with such variation in the radiation detector time lag, as by utilizing a signal representative of the existing slit width to introduce a variable phase shift in the synchronizing demodulator signal.

3,659,943

FLOATING LIQUID MONITOR

Alvin D. Goolsby, Moraga, Calif., assignor to Shell Oil Company, New York, N.Y.

Filed Jan. 15, 1970, Ser. No. 3,161
Int. Cl. G01n *33/28, 21/48, 21/06*
U.S. Cl. 356—70 **11 Claims**



Apparatus for detecting the presence of a reflective liquid of lesser density floating on a more dense liquid of different reflectivity wherein the intensity of a beam of reflected light is measured to detect the presence of less dense liquid.

3,659,944

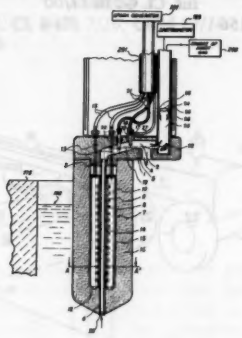
APPARATUS FOR CONTINUOUS SPECTRAL ANALYSIS OF MOLTEN SUBSTANCES

Milan Bojic, Metz, France, assignor to Institut de Recherches de la Siderurgie Francoise, Saint Germain-en-Laye, France

Filed Feb. 24, 1971, Ser. No. 118,303
Claims priority, application France, Feb. 27, 1970, 7007139
Int. Cl. G01j *3/30, 3/00;* **G01n** *1/10*
U.S. Cl. 356—86 **10 Claims**

Apparatus for direct and continuous spectrometric analysis of molten metals has a riser which draws a continuous stream of molten metal from a furnace in response to actuation of an electromagnetic pump. The stream flows through a spark chamber which contains a sill or barrier over which the metal

must flow to rise to a predetermined level at a desired distance from a first electrode which is connected with one pole of a spark generator. The other pole of the spark generator is connected with a second electrode which dips into the stream of molten metal in the chamber with attendant generation of a spark between the exposed surface of



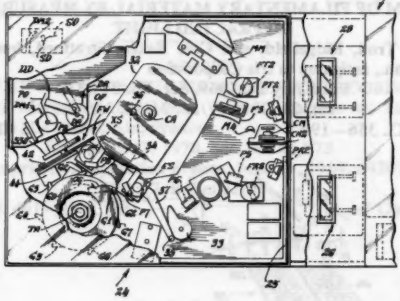
the stream and the first electrode. The light or radiation which is generated by the spark is directed into a spectrometer by way of a horizontal or vertical tube. Such tube further serves to admit into the spark chamber a stream of inert gas which evacuates metallic vapors developing in the chamber in response to generation of the spark.

3,659,945

SCANNING MONOCHROMATORS

John M. Rocke, West Redding, and Rene C. Sawyer, Jr., Shelton, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Nov. 19, 1969, Ser. No. 878,102
Int. Cl. G01j *3/06, 3/18*
U.S. Cl. 356—100 **6 Claims**



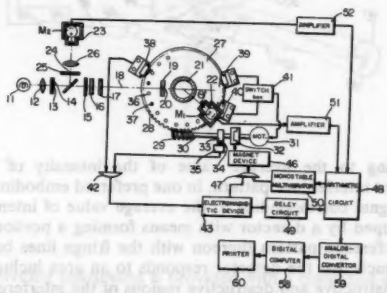
A scanning monochromator includes a plurality of diffraction gratings mounted on a rotatable turret, so that each grating may be moved and precisely indexed into operative position. Each grating so positioned is angularly rotated about its axis by the same scanning arm, driven by a cam having two similar (but different) contours for producing one of two similar scanning functions for the various gratings. Preferably more interchangeable order-separating filters than gratings are included to insure complete and efficient filtering (e.g., 14 filters for 7 gratings). Both the stepping of the grating turret and of the filters (e.g., on a filter wheel) are controlled by (digital) signals, derived from the actual wavenumber being separated, as precisely read by (coarse and fine) digital encoder discs on the wavenumber scanning driving shafts (before and after a large-ratio reduction system). The digital control signals and a signal indicating the operative grating provide a readout of the wavenumber, directly usable by data processing apparatus. The closed loop digital nature of the control signals are free of any non-systematic errors, and allow the instrument to be "indexed" to any desired wavenumber (and then "instructed" to scan to any other wavenumber automatically).

3,659,946

AUTOMATED LIGHT SCATTERING PHOTOMETER

Schichibei Kozawa, and Hideki Yamamoto, both of Kyoto City, Japan, assignors to Shimadzu Seisakusho Ltd., Nakakyo-ku, Kyoto-shi, Kyoto-fu, Japan

Filed Dec. 9, 1970, Ser. No. 96,508
Claims priority, application Japan, Dec. 10, 1969, 44/117890
Int. Cl. G01n *21/00, 21/06, 21/26*
U.S. Cl. 356—104 **12 Claims**



An automated light scattering photometer characterized in that a photoelectric unit used to measure the intensity of light scattered from the sample container at different angles relative to the optical axis of the instrument can be intermittently rotated. This can be achieved by the provision of a pair of switching means, one of which being adapted to be actuated by a pin vertically disposed on the upper surface of a rotary member mounted with said photoelectric unit and the other of which being adapted to be actuated by an actuator means rigidly mounted on a shaft for transmitting the rotational force from a motor to the rotary member. When these switches are closed at the same time, the rotation of the rotary member can be stopped by means of a clutch means. In addition, this photometer of the present invention can be utilized in connection with a commercially available computing machine. To this end, means for integrating the output of the photoelectric unit and that of another photoelectric unit is provided, the output of said integrating means being adapted to be applied to the computing machine.

3,659,947

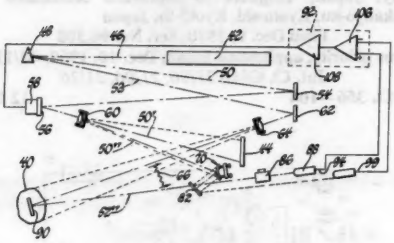
HOLOGRAPHIC APPARATUS WITH AUTOMATIC CONTROL SYSTEM FOR MAINTAINING CONSTANT PHASE RELATION BETWEEN REFERENCE AND OBJECT BEAMS

Don B. Neumann, Ann Arbor, Mich., assignor to GCO, Inc., Ann Arbor, Mich.

Filed June 18, 1970, Ser. No. 47,291
Int. Cl. G02b *27/00;* G01j *1/20*
U.S. Cl. 356—106 **11 Claims**

Apparatus for making holograms is disclosed which includes an arrangement for maintaining a constant phase relationship between the object and reference beams so that the fringe pattern remains stationary during the recording period. The apparatus includes means for detecting spurious motion of the object or elements of the apparatus by means responsive to the intensity of a portion of the wavefront interference pattern. The detection signal which is taken as being

indicative of a phase shift between the reference and object waves is applied to an automatic control system including amplifying means and a transducer disposed in one of the beam paths for producing a corrective phase shift thereof relative to the other beam. The quiescent operating point for the automatic control system is established by an automatic bias system which includes means for producing a signal corresponding to the average value of the intensity of the wavefront interference pattern. In one preferred embodiment a bias signal corresponding to the average value of intensity is developed by a detector with means forming a portion of the interference pattern thereon with the fringe lines being spaced such that the detector responds to an area including both constructive and destructive regions of the interference pattern.

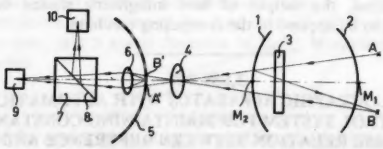


3,659,948

OPTICAL DEVICE FOR ALIGNING AN OBJECT LOCATED AT AN ARBITRARY DISTANCE FROM THE DEVICE

Hendrik De Lang, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 13, 1970, Ser. No. 27,894
Claims priority, application Netherlands, Apr. 23, 1969, 6906306
Int. Cl. G01b *11/26*
U.S. Cl. 356—110 **4 Claims**



An improvement of an optical device for aligning an object located at an arbitrary distance from the device is described in which the device includes two identical or substantially identical concave mirrors the reflecting concave surfaces of which face each other and which each contain the center of curvature of the other mirror, and at least one **/4-plate.

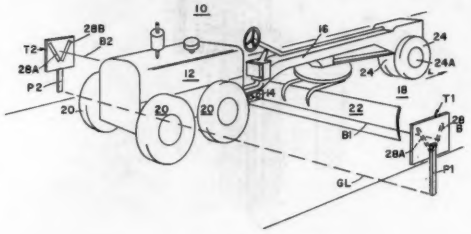
It is shown that by successively including a beam chopper and a beam splitter in the light paths of the beams which emerge from the optical system the device can be adapted to photo-electric alignment without a spatial separation between the observed object and its image.

3,659,949

LASER BEAM SYSTEMS AND APPARATUS FOR DETECTING AND MEASURING PARAMETRIC DEVIATIONS BETWEEN SURFACES AND THE LIKE

Robert R. Walsh, and Martin A. Apostolico, both of Wilmington, Del., assignors to Technidyne, Inc., Wilmington, Del.

Filed Apr. 20, 1970, Ser. No. 30,174
Int. Cl. G01b *11/00*
U.S. Cl. 356—156 **15 Claims**



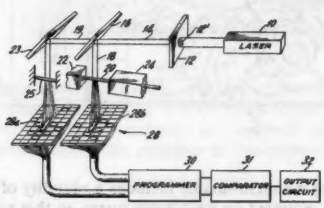
A deviation detection and measuring system and apparatus are provided for determining the proper generation of roadbed surfaces and the like in which a laser beam is projected from each side of an ambulatory road grader onto retro-reflective targets of predetermined configuration adjacent to the roadbed, said targets having a known orientation with respect to the ultimately desired dimensions and orientation of the roadbed. Detection devices on the grader detect the laser beams reflected from the target configurations and effectuate a readout such that the current dimensional parameters of the roadbed are determined and compared with the ultimately desired dimensional parameters thereof.

3,659,950

LASER APPARATUS FOR DETECTING THE SIZE AND FORM OF FILAMENTARY MATERIAL BY MEASURING DIFFRACTED LIGHT

John Troll, Ridgefield, and Cole Baker, Stratford, both of Conn., assignors to Iris Corporation

Filed July 14, 1969, Ser. No. 841,213
Int. Cl. G01n *21/18, 21/30, 21/16*
U.S. Cl. 356—199 **5 Claims**



A device for measuring moving filaments includes a laser whose beam is split and the split beams not blocked directed upon distinct filament portions; the light diffracting past the filaments falls upon respective optical sensors. The filament portions may be either longitudinally spaced along the same filament, angularly spaced about the same longitudinal filament position or include the moving filament and a standard. The outputs of the optical sensing means are compared and a signal is produced representative of such a comparison. An arrangement is also disclosed which employs selected energy levels within the diffraction pattern of an unsplit beam to precisely measure a moving filament.

3,659,951

CARTRIDGE FOR A WRITING IMPLEMENT

Werner Germann, Viganello, Lugano, Switzerland, assignor to Amerasia Enterprises, Incorporated, Charlotte Amalie St. Thomas, V.I.

Filed Mar. 11, 1970, Ser. No. 18,544
Claims priority, application Switzerland, Apr. 23, 1969, 6381/64
Int. Cl. B43k 7/10; C09d 11/18
U.S. Cl. 401—190 10 Claims

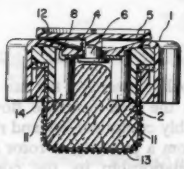
A writing implement cartridge containing a writing medium under pressure, which cartridge has therein a mixture of a highly viscous substance and a chemically reactive substance and a second chemically reactive substance which, when placed in contact with each other, generate a gas so as to maintain the writing medium in said cartridge under pressure, said writing medium comprising a mixture of a highly volatile solvent and a low volatility solvent, thickening agents, and pigments. In addition, the invention is directed to the method of producing the cartridge and the writing medium contained therein.

3,659,952

BRUSH FOR CLEANING GRAMOPHONE RECORDS

Charles Moransais, La Boisse, France, assignor to Zafira France, La Boisse, Ain, France

Filed June 17, 1970, Ser. No. 46,873
Claims priority, application France, June 19, 1969, 6920280
Int. Cl. B43m 11/06
U.S. Cl. 401—196 7 Claims



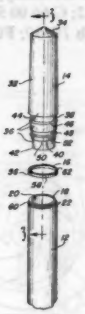
A brush specially intended for cleaning gramophone records comprises a thick plate of moulded plastic material associated with a piece of velvet fabric, the plate being provided with a reservoir of liquid closed by a cover plate and capable of being supplied with a liquid suitable for moisturizing the tufts of velvet fabric.

3,659,953

PLUG AND BARREL ASSEMBLY FOR MARKING DEVICE

Guy A. Taylor, Batavia, Ill., assignor to Sanford Research Company

Filed Apr. 21, 1970, Ser. No. 30,518
Int. Cl. B43k 8/00
U.S. Cl. 401—198 13 Claims



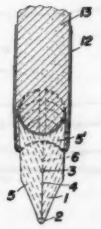
A writing instrument is provided with a combined decorative and functional ring or band at the juncture between the plug and the barrel of the reservoir section of the instrument. The ring or band cooperates with means on the plug to effect a locking and a sealing relationship between the plug and the barrel.

3,659,954

FOUNTAIN PEN

Heinz Gunther Herrnring, Hamburg-Fuhlsbuttel, Germany, assignor to Montblanc-Simplo GmbH, Hamburg, Germany

Continuation of application Ser. No. 839,228, July 7, 1969, now abandoned. This application Mar. 16, 1971, Ser. No. 124,990
Claims priority, application Germany, July 10, 1968, P 17 61 812.1
Int. Cl. B43k 5/02
U.S. Cl. 401—223 4 Claims



A fountain pen and method of making same according to which liquid ink is from an ink container conveyed through a capillary section to a gap leading to the writing tip of the pen while the foil forming the writing pen is covered and capillary passages lead into the pen gap, which passages have their opposite ends communicating with the ink container.

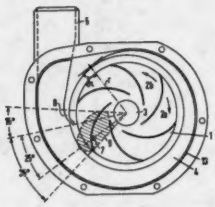
ERRATUM

For Class 408—1 see:
Patent No. 3,659,482

3,659,955
DEVICE FOR AUTOMATICALLY STOPPING DELIVERY OF LIQUID BY A CENTRIFUGAL PUMP DURING REVERSE OPERATION THEREOF

Siegfried Schonwald, Bad Neustadt, Saale, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed July 14, 1969, Ser. No. 841,299
Claims priority, application Germany, July 13, 1968, P 17 03 815.2; G 66 00 523
Int. Cl. F04b *19/00*; F04d *1/00*
U.S. Cl. 415—116 12 Claims

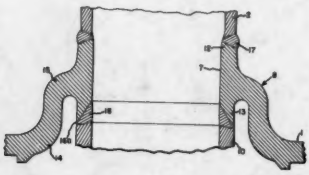


Device for automatically stopping delivery of liquid by a centrifugal pump operating in reverse running condition through the introduction of air into the pump chamber of the pump includes means defining a bore formed in the housing of the pump for connecting the pump chamber to atmosphere, and means cooperating with the bore-defining means for adjusting the pressure in the pump chamber to positive pressure in forward running condition of the pump rotor and to negative pressure in reverse running condition thereof whereby in the latter condition air is sucked from the atmosphere into the pump chamber to stop delivery of liquid by the pump.

3,659,956
WELDED INLET PIPE AND NOZZLE BOX CONSTRUCTION FOR STEAM TURBINES

Earl H. Brinkman, Schenectady, N.Y., assignor to General Electric Company

Filed Dec. 14, 1970, Ser. No. 97,560
Int. Cl. F01d *1/00*; F04d *1/08*
U.S. Cl. 415—219 4 Claims

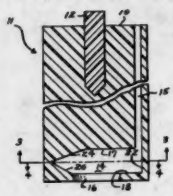


A welded inlet pipe and nozzle box construction for a steam turbine which provides flexible support for the nozzle box. The flexing portions of the construction subject to high stress are in a weld-free location, while the main weld connecting the nozzle box to the turbine shell is located to prevent leakage into the power station should a defect occur.

3,659,957
APPARATUS FOR ATOMIZING LIQUID MATERIALS

Vann Yuen, 2809 Land Park Drive, Sacramento, Calif.

Filed Oct. 27, 1969, Ser. No. 869,665
Int. Cl. B01f *7/24*
U.S. Cl. 416—179 4 Claims

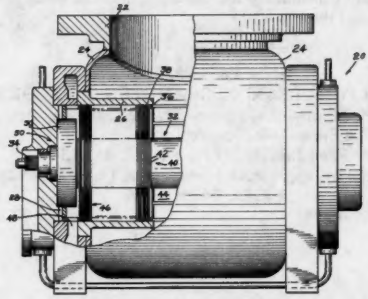


An apparatus for atomizing liquid materials comprises a solid cylindrical body having a rotation means attached to one end and a chamber formed in the other end thereof. Passageways extending through the cylindrical body to the chamber are so arranged that their vertical axes are parallel to and adjacent the sides of the body. An opening is provided into the chamber which has complementary ribs formed in its top and bottom. The apparatus can be employed in a variety of mixing and liquid contacting operations, but it is particularly useful for effecting contact between mercury and agents used in its purification.

3,659,958
BUILT UP ROTOR ASSEMBLIES FOR VACUUM PUMPS

Charles A. Schulte, deceased, late of Lexington, Mass. (by Grace Schulte, executrix)

Filed Oct. 27, 1969, Ser. No. 869,968
Int. Cl. F01d *5/06*
U.S. Cl. 416—199 6 Claims



A composite impeller assembly for use in a high vacuum pump operating in the free-molecule flow pressure range. The impeller assembly comprises left and right hand impeller units each made from a plurality of rotor assemblies held in closely abutting relationship by the cooperating relation between at least one fastener and a central core shaft extending through each of the rotors. Each rotor includes a row of blades and a hub portion with front and rear annular contact surfaces thereon, and a center portion extending inwardly and terminating adjacent a central opening for receiving the shaft. The effect of the built-up construction is that the contact surfaces provide a large effective impeller hub diameter for maximum stiffness against deflection, and the relatively

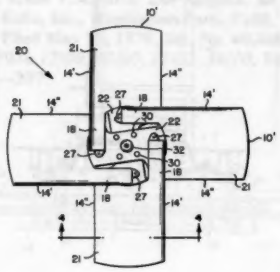
small diameter center openings reduce stresses which would be present with an opening of an order equal to the diameter of the hubs just inside the contact surfaces.

3,659,959

AIR FAN IMPELLER BLADE ASSEMBLY

Allan Holstrom, Rochester, N.Y., assignor to Fasco Industries, Inc., Rochester, N.Y.

Filed July 15, 1970, Ser. No. 55,168
Int. Cl. F04d 29/34
U.S. Cl. 416—212 5 Claims



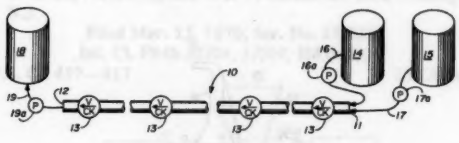
This impeller is constructed from two, identical, preformed metal blanks, which have raised center or hub sections which are secured to one another by riveting or the like. Opposite ends of each blade are laterally offset from one another slightly. Oppositely extending tabs are struck up from opposite sides of each blade at opposite sides of the hub section to provide slots by which the blades are interconnected to extend at right angles to one another. The tabs of one blade are secured to the hub section of the other blade to lend rigidity to the hub sections. A separate bearing may be secured in registering central openings in the hubs of the two blades to accommodate the armature shaft of a drive motor.

3,659,960

TRANSMISSION OF FLUIDS THROUGH A PIPELINE

Donald D. Dunlop, Fairfax, Va., assignor to Creative Enterprises International, Norman, Okla.

Filed Nov. 13, 1969, Ser. No. 876,353
Int. Cl. F04b 19/24; F04f 1/18
U.S. Cl. 417—53 3 Claims



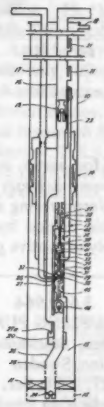
A volatile fluid is transmitted through a pipeline containing a series of check valves by differential heating along contiguous sections of the pipeline to create a decreasing temperature gradient and a consequent decreasing pressure gradient in the direction of desired transmission to thereby cause fluid flow in a desired direction, the check valves preventing the reversal of fluid transmission upon reversal or discontinuance of the temperature gradient. In long pipelines, the differential heating is supplied by the sun moving along the pipeline. Multicomponent fluids can be transmitted by a selection of a volatile mixture of fluid components in such proportions as to create desired pressure differentials and rates of transmission.

3,659,961

GAS LIFT SYSTEM

Charles Paul Lamb; William A. Dudley, both of Dallas, Tex.; George S. Kingsley, Ventura, Calif., and Edward E. DeMoss, Garland, Tex., assignors to Teledyne, Inc., Los Angeles, Calif.

Filed Aug. 7, 1970, Ser. No. 61,943
Int. Cl. F04f 1/18
U.S. Cl. 417—114 11 Claims



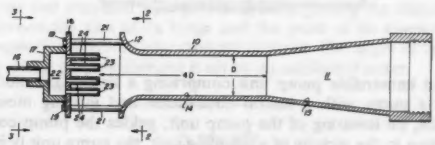
An apparatus and system for alternately venting and lifting fluid from an accumulator in which the alternate connection of the accumulator with a vent and a gas source is controlled by the differential in pressure between two tubes, one of which contains well fluids and the other of which contains well fluids and into which a small quantity of gas is bled.

3,659,962

ASPIRATOR

John Smith Zink; Hershel Goodnight, and Robert D. Reed, all of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed June 2, 1970, Ser. No. 42,775
Int. Cl. F04f 5/46; B05b 7/06; F23d 13/40
U.S. Cl. 417—179 3 Claims



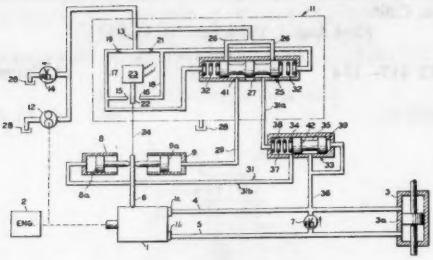
An aspirator assembly for drawing air into the presence of gas and mixing the gas with the air wherein the gas under pressure is released through a plurality of orifices or nozzles with the flow of the gas from the multitude of orifices serving to provide energy for the inspiration of air into the gas streams and for mixture of the air with the gas in the aspirator assembly.

3,659,963

PRESSURE OVERRIDE FOR SERVO CONTROLLED PUMPS

Lyston C. Jennings, Watertown, N.Y., assignor to General Signal Corporation

Filed Mar. 19, 1970, Ser. No. 20,892
Int. Cl. F04b 49/00
U.S. Cl. 417—213 7 Claims



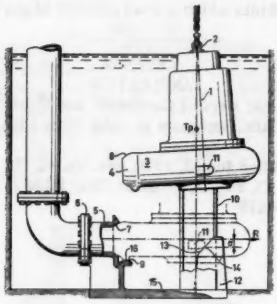
A pressure override for servo controlled pumping apparatus which reduces pump delivery rate as needed to limit discharge pressure by overpowering the servomechanism, in contrast to disabling this device by interrupting its input signal circuits or its supply of motive power.

3,659,964

SELF-COUPLING PUMP UNIT

Jens Karl Adolf Dahlgren, Stockholm, Sweden, assignor to Stenberg-Flygt AB, Solna, Sweden

Filed Aug. 27, 1970, Ser. No. 67,329
Claims priority, application Sweden, Aug. 29, 1969, 12019/69
Int. Cl. F04b 17/00, 35/00; B67d 5/40
U.S. Cl. 417—360 7 Claims



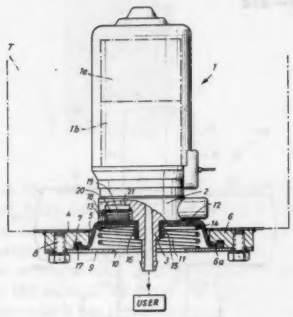
An immersible pump unit comprising a liquidtight motor and a pump with a lateral connection and guiding means which, on lowering of the pump unit, guides the pump connection to the vicinity of a coupling unit, the pump unit being suspended so that the central axis of the pump runs slightly obliquely downwards, there being close to the coupling unit a support for the pump unit in its lowered position. There is in the extension of the coupling unit beyond the support, at least one stop with an inclined plane facing the coupling unit, the point of contact between the pump unit and the inclined plane of the stop lying a distance below an imaginary line of operation for the force of reaction generated at the connection and coupling unit by the pump pressure.

3,659,965

FUEL PUMP MOUNTING ARRANGEMENT

Jurgen Ebert, Gerlingen, and Hermann Nusser, Asperg, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 17, 1970, Ser. No. 64,370
Claims priority, application Germany, Sept. 19, 1969, P 19 47 505.9
Int. Cl. F04b 17/00, 35/00, 35/04; B67d 5/42
U.S. Cl. 417—363 9 Claims



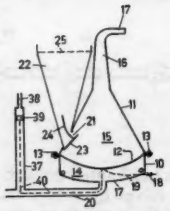
An electrically operable fuel pump is accommodated in the interior of a fuel tank so as to be at least partly immersed in fuel fluid contained in the tank. The bottom wall of the tank is provided with an opening through which the outlet of the pump communicates with the exterior of the tank and a spring arrangement is located in this opening and mounts the pump on the bottom wall over the opening with freedom of displacement relative to the tank so as to preclude or at least reduce the transmission of vibratory motions between the tank and the pump. A diaphragm seals the opening with reference to the exterior of the tank and at the same time acts to limit the displacement of the spring arrangement and thereby of the pump in direction normal to the general plane of the opening.

3,659,966

PUMPING APPARATUS FOR FLOWABLE CONCRETE OR THE LIKE

Peter Faber, 14 Bothard Genrose, Auckland, New Zealand

Filed Apr. 24, 1970, Ser. No. 31,663
Int. Cl. F04b 43/06, 45/00, 15/02
U.S. Cl. 417—395 6 Claims



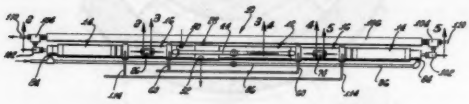
A pumping apparatus for flowable concrete or the like, the apparatus including at least one driving chamber separated from at least one driven chamber by at least one flexible diaphragm which is movable between predetermined posi-

tions by the flow of pressurized liquid into and out of the or each driving chamber, a pumping unit having its inlet adapted for connection to a liquid supply source and its outlet connected to the inlet of the or each driving chamber and outlet of the driven chamber for connection to a controlled discharge, the construction and arrangement being such that on flowable concrete being allowed to flow into the or each driven chamber onto its diaphragm, differential pressure is applied to the or each diaphragm to cause the concrete to be pumped through the outlet of the or each driven chamber.

3,659,967

HYDRAULIC INTENSIFIER

Ralph F. McArthur, Huntington Park; Max T. Kardoes, Glendora, and Melle F. Geurts, Los Angeles, all of Calif., assignors to Kobe, Inc., Huntington Park, Calif.

Filed May 27, 1970, Ser. No. 40,860
Int. Cl. F04b *17/00, 35/00, 21/02, 39/10;* **F01b** *11/02*
U.S. Cl. 417—397 **13 Claims**

A hydraulic intensifier operable by a fluid, such as oil, at relatively low pressures to deliver a fluid, such as water, at very high pressures for any desired purpose. The intensifier includes a fluid operated, double acting, reciprocating engine and two single acting, reciprocating pumps respectively located at opposite ends of and in alignment with the engine and connected to the engine for actuation thereby, the displacement of the pumps being small as compared to that of the engine so as to produce a discharge pressure many times the operating fluid pressure.

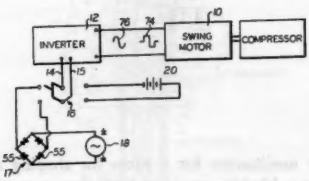
The intensifier is capable of producing discharge pressures of the order of 30,000 to 70,000 psi, or higher, with operating fluid pressures of the order of 2,000 to 5,000 psi. Further, the intensifier is capable of transmitting power of the order of 50 horsepower, or more, in a relatively lightweight unit which is portable and relatively maneuverable.

3,659,968

INVERTER SYSTEM WITH RESONANT ELECTRODYNAMICAL DEVICE

John A. Thomas, Jr., and Gerhard D. Spangenberg, both of Boonton, N.J., assignors to J. P. Industries, Inc., Stanhope, N.J.

Filed Mar. 13, 1970, Ser. No. 19,223
Int. Cl. F04b *35/04, 17/04;* **H02b** *3/00*
U.S. Cl. 417—417 **13 Claims**



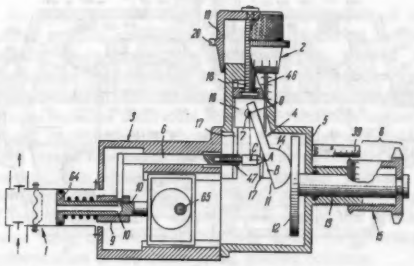
This invention combines a resonant electrodynamical device with an electromagnetic oscillator that has its period of oscillation syntonized with the natural period of oscillation of the resonant electrodynamical device. In the preferred embodiment, the resonant electrodynamical device is a swing motor connected with a compressor load, and power for driving the swing motor is supplied by the syntonic oscillator. A feedback from the swing motor maintains the oscillator in syntonization with the natural period of oscillation of the swing motor.

3,659,969

CONTROL DEVICE FOR METERING PUMPS

Lev Nikolaevich Britvin, ulitsa Dybenko, 12, kv. 51; Vitaly Andreevich Sergeev, ulitsa Semenovskaya, 3/1, korpus 1, kv. 24; Konstantin Semenovich Spassky, Varshavskoe shosse, 176 "a", korpus 8, kv. 69; Igor Nikolaevich Smirnov, Telegrafny pereulok, 15, kv. 20; Gennady Mikhailovich Scheglov, ulitsa Glavnaya, 7 kv. 4; Alexandr Alexandrovich Shtelmakh, Astakhovsky pereulok, 1/2, kv. 123; Boris Moiseevich Prudovsky, ulitsa Dybenko, 4, kv. 10; Vladimir Karpovich Karakhanian, ulitsa Stromynka, 23, kv. 132; Viktor Vasilievich Ivanov, ulitsa Krasnoprudnaya, 26, kv. 26, and Mikhail Ivanovich Semenov, Pokrovsky bulvar, 8, kv. 13, all of Moscow, U.S.S.R.

Filed Oct. 27, 1969, Ser. No. 869,475
Int. Cl. F04b *23/00, 41/00*
U.S. Cl. 417—440 **18 Claims**



A control device for metering pumps is provided with a setter connected via at least one intermediate element with the pump delivery control mechanism, which latter ensures a directly proportional relation between the pump delivery and the movement of said intermediate element. The connection of the intermediate element with the setter is effected by means of a pivoted element installed at an angle to the intermediate element, the pivoted element interacting with the setter and provided with provision for adjusting the distance between the axis of its hinge and the point of its kinematic connection with the intermediate element. The angle of turning of the pivoted element is set by an additional setter.

3,659,970

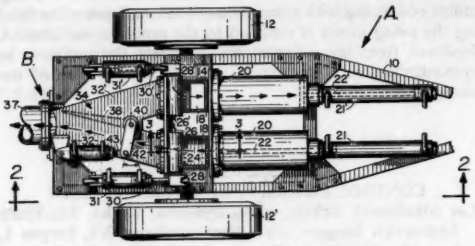
CONCRETE PUMP

Philip W. McElroy, 2300 Dolores Court, Pinole, Calif.

Continuation-in-part of application Ser. No. 750,332, Aug. 5, 1968, now abandoned. This application Aug. 14, 1969, Ser. No. 859,233
Int. Cl. F04b *7/00*
U.S. Cl. 417—516 **2 Claims**

A pump for conveying fluid aggregate-containing concrete from a hopper to the location desired including an improved

valve that allows for sequentially advancing concrete from a



pair of chambers by extension and withdrawal of respective pistons.

3,659,971

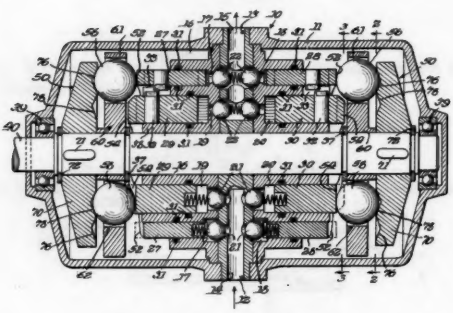
FLUID TRANSDUCER

Henry Schottler, North Riverside, Ill., assignor to Roller Gear Ltd., Zug, Switzerland

Filed Apr. 23, 1970, Ser. No. 31,314

Int. Cl. F04b *23/06*

U.S. Cl. 417—538 **5 Claims**



A cam drive mechanism for reciprocating a plurality of pistons in a fluid transducer comprising opposed annular lobed cam surfaces and flat reaction tracks for each piston; a plurality of rolling members positioned between each of said opposed cam surfaces and tracks; and a common retainer spacing said rolling means uniformly around said cam surfaces; with said retainer and tracks adapted so that said rolling means roll between each of said opposed surfaces and tracks with substantially the same angular movement and speed.

3,659,972

DIAMOND IMPLOSION APPARATUS

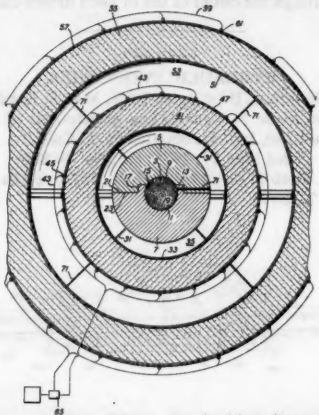
Donald R. Garrett, 1113 Westover, College Station, Tex.

Continuation of application Ser. No. 708,331, Feb. 26, 1968, now Patent No. 3,499,732. This application Feb. 17, 1970, Ser. No. 870,323

Int. Cl. B29c *13/00*

U.S. Cl. 425—1 **2 Claims**

A device for artificially producing diamonds or other articles of substantial hardness by utilization of heat and pressure over an instantaneous time period. The device, which is designed to achieve the requisite heat and pressure by detonation in an implosive manner, consists of two mating hemispheric bodies having a centrally interior cavity of spherical configuration. The two bodies are adapted to be affixed to one another in a positive manner, such as by internal screw threads. The hollow hemispherical bodies, which may be of bronze or other relatively soft material, are suspended such as by nylon string, within a hollow plastic shell. An explosive material is positioned about the exterior surface of the shell in an even and uniform manner with a plurality of detonators operatively connected to the explosive at ap-



propriately spaced positions. An ignition harness is connected to the detonators so that they may all be actuated in a simultaneous manner. The material which is to be transformed, such as graphite or other carbonaceous matter, is disposed in the cavity of the bodies and upon detonation of the explosive there is created extreme inwardly directed pressures and temperatures which transform the carbonaceous material into stable diamond.

3,659,973

CENTER MECHANISMS FOR PRESSES TO SHAPE AND CURE TIRES

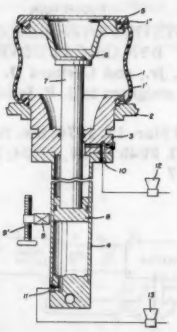
Shoushi Yoshida; Atsuaki Iwama; Takashi Okada, and Tetsuo Suda, all of Kobe, Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed Oct. 5, 1970, Ser. No. 78,019

Claims priority, application Japan, Oct. 6, 1969, 44/80069

Int. Cl. B29h *5/02*

U.S. Cl. 425—29 **3 Claims**



A center mechanism for a press for shaping and curing tires having a bladder member including, a vertical power cylinder of non-magnetic material, a piston in the power cylinder attached to the bladder to selectively erect and collapse it and constructed at least partially of magnetic material, and a magnetic sensor positioned exteriorly of the power

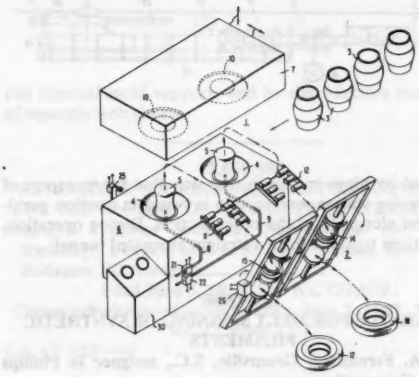
cylinder and controlling movement of the piston responsive to a detected position of the piston.

3,659,974

TIRE CURING APPARATUS MONITORING AND CONTROL

Ernst J. Neugroschl, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 6, 1968, Ser. No. 750,512
Int. Cl. B29h *5/00, 17/00*
U.S. Cl. 425—29 **2 Claims**



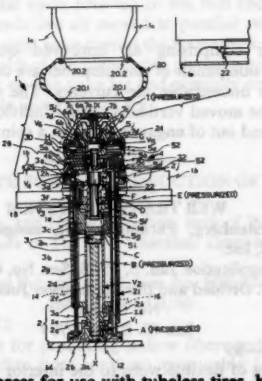
In the process of molding and curing pneumatic tires, this invention senses certain selected quantities (e.g., cure cycle length) in the tire press and, in some applications, a post cure inflator, and feeds the sensed signals to a digital computer. The computer scans the input and compares it with prestored ideal values. If the sensed data differs from the stored values by too great a degree, the computer provides an appropriate output. Further, the computer may control a tire marker to mark those tires which fail the comparison. In addition, by feeding information to the computer from a plurality of presses, accurate inventory counts, production requirements, production and press break-down history, and so forth, may be maintained automatically.

3,659,975

BAGLESS TIRE PRESS

Jean Leblond, Oise, France, assignor to Uniroyal Englebert France S.A., Neuilly-sur-Seine, France

Filed Aug. 17, 1970, Ser. No. 64,414
Int. Cl. B29h *5/02*
U.S. Cl. 425—36 **15 Claims**



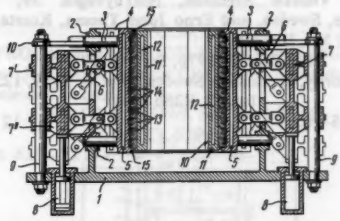
An inflation press for use with tubeless tires, having utility in vulcanization equipment and all other mechanisms which require an air-tight bead seal. In contra-distinction to prior art approaches, the bead-sealing function is carried out by a pair of resilient annular rings each having one edge which is clamped in place and another edge which is freely deformable by suitable camming elements which are responsive to various nested fluid-operated jack mechanisms. This camming action distends the sealing rings radially outwardly against the beads of a tire or carcass to perform the sealing function during vulcanization or any other operation requiring an air-tight seal.

3,659,976

APPARATUS FOR MOLDING AND VULCANIZATION OF ANNULAR RUBBER ARTICLES

Arsenty Vasilievich Yavorsky, ulitsa Zaponskogo, 14v, kv. 70, Kiev; Grigory Lvovich Farber, ulitsa Kutuzova, 33a, kv.66, Tula, and Grigory Andreevich Gavrilenko, ulitsa Politekhnicheskava, 31v, kv.4, Kiev, all of U.S.S.R.

Filed Aug. 21, 1970, Ser. No. 66,032
Int. Cl. B29h *5/00, 7/22;* **B29d** *29/00*
U.S. Cl. 425—42 **1 Claim**



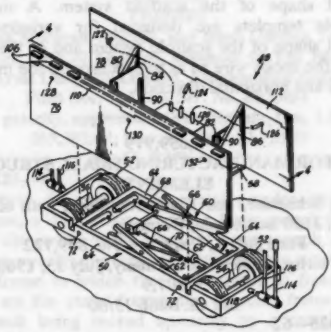
An apparatus for molding and vulcanization of annular rubber articles comprising a drum adapted to receive and support thereabout the articles to be treated and a mechanism for external pressing of the articles received about the drum. The mechanism for external pressing of the articles includes individual selectively heatable segments arranged concentrically about the drum and associated with drive means for displacing these segments radially of the apparatus, this drive means including an annular frame pivotally connected through pivoted arms with the segments of the mechanism for external pressing of the articles, the frame being associated with power means for effecting axial reciprocation of the frame along guiding columns.

3,659,977

APPARATUS FOR ERECTING POURED CONCRETE STRUCTURES

John F. Haws, c/o Stonoror and Haws, 2207 Chestnut Street, Philadelphia, Pa.

Filed Aug. 7, 1970, Ser. No. 62,007
Int. Cl. B28b *7/08*
U.S. Cl. 425—62 **18 Claims**



Apparatus is disclosed wherein movable pouring forms are mounted on a chassis, such as the chassis of a roadable vehi-

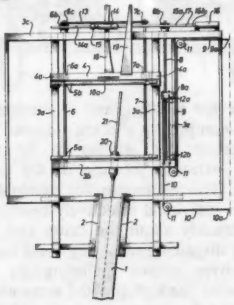
cle. Movement of the forms between respective selectable positions facilitates pouring of vertical and horizontal structural members, respectively. The pouring forms may be elevated with respect to the chassis to position them for pouring the upper portions of high vertical walls, or highly placed horizontal walls. The apparatus also includes means whereby the chassis itself may climb with respect to the lower portions of poured vertical members, to facilitate pouring of the upper portions of such members. In another of its aspects, the invention is a method of erecting poured concrete structures by first pouring vertically oriented members, such as walls, and permitting the walls to set; pouring the uppermost horizontal member, such as the roof, and permitting such member to set; and then pouring successively lower interior horizontal members to complete the structure.

3,659,978

FLEXIBLE SCAFFOLD FOR SUPPORTING SLIDING MOLDS OR CLIMBING MOLDS USED FOR THE ERECTION OF CONCRETE STRUCTURES

Sven-Erik Vilhelm Svensson, Norrbyvagen 39, 141-43 Huddinge, Sweden, and Erno Jozef Thoma, Koszta J.u.1., Budapest XII, Hungary

Filed Sept. 3, 1970, Ser. No. 69,379
Claims priority, application Sweden, Sept. 8, 1969, 12380/69
Int. Cl. B28b 7/04
U.S. Cl. 425—63 **12 Claims**



A sliding or climbing mold for the erection of concrete structures the horizontal cross-section of which varies vertically comprises a scaffold system composed by a plurality of flexible scaffold units. Each such unit consists of two pivotably interconnected and intersecting rods or the like separated by yokes supporting the mold. First and second hydraulic jacks acting in the vertical and horizontal directions, respectively, accomplish the vertical movement of the scaffold system and contribute to the change of the horizontal size thereof. A spoke assembly connected to the scaffold system and comprising substantially radially and horizontally located spoke wires is used for variation of the horizontal shape of the scaffold system. A number of replaceable templets are designed for variation of the horizontal shape of the scaffold system and of the effective length of the spoke wire so as to synchronize the movements in vertical and horizontal direction.

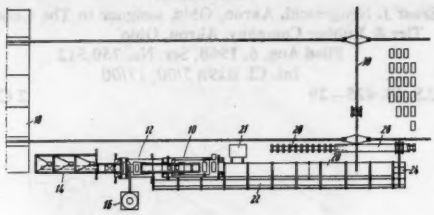
3,659,979

PLANT FOR MANUFACTURING SMALL STRUCTURAL ELEMENTS

Wolfgang Schneider, and Klaus Schneider, both of Musshardiveg 8, 2150 Buxtehude, Germany

Filed July 7, 1969, Ser. No. 839,722
Claims priority, application Germany, July 13, 1968, P 17 71 807.9
Int. Cl. B28b 15/00
U.S. Cl. 425—62 **3 Claims**

A plant for manufacturing small structural concrete elements comprises a production station and a hardening station which both are provided with means for loading or unloading from a carrier vehicle. The hardening station is formed by a steam treatment tunnel consisting of two sections which are



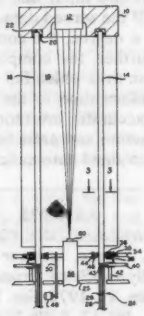
connected by hinge means in that way that for transport of the hardening station, one section is swung in position parallel to, and alongside of the other section. During operation, both sections together form a straight elongated tunnel.

3,659,980

APPARATUS FOR MELT SPINNING OF SYNTHETIC FILAMENTS

Miguel A. Fernandez, Greenville, S.C., assignor to Phillips Fibers Corporation

Filed May 11, 1970, Ser. No. 36,031
Int. Cl. D01d 3/00, 5/08
U.S. Cl. 425—72 **11 Claims**



Apparatus comprising an improved quench chamber wherein the side panels of said chamber are constructed so as to eliminate undesirable air currents. The side panels are adapted to be moved vertically, either individually or collectively, into and out of engagement with a spinning block.

3,659,981

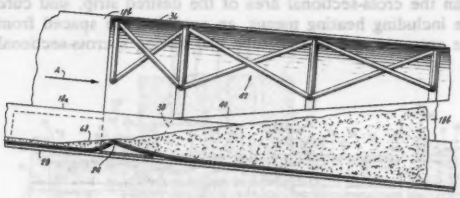
WEB TRANSFER SYSTEM

Charles Ferstenberg, Paramus, N.J., assignor to Tenneco Chemicals, Inc.

Original application Jan. 5, 1968, Ser. No. 696,070, now abandoned. Divided and this application June 1, 1970, Ser. No. 54,048
Int. Cl. B29d 27/04
U.S. Cl. 425—89 **13 Claims**

Contouring of flexible webs to the interior of an elongated moving molding channel by the provision of specially located

and specially shaped guiding devices, by the provision of special internal mold supports and by the selective overlapping of separate web sheets.

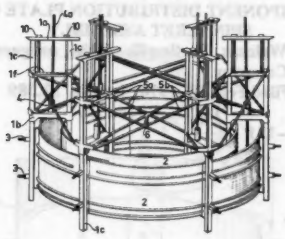


3,659,982

EXTENSIBLE LOCKING SYSTEMS FOR FORMWORK FOR THE CASTING OF CONCRETE CONSTRUCTIONS

Sven-Erik Vilhelm Svensson, Norrbyvagen 39, 141 43 Huddinge, Sweden, and Erno Jozef Thoma, Koszta J.u.1, Budapest XII, Hungary

Filed June 3, 1968, Ser. No. 734,079
Claims priority, application Sweden, June 2, 1967, 7785/67
Int. Cl. E04g *11/22*
U.S. Cl. 425—63 4 Claims



The present invention relates to apparatus for casting concrete structures having a varying cross-section and includes a plurality of interconnected units. Each of the units includes at least two rods of equal length which are pivotally interconnected to one another at their mid points, the ends of adjacent units being pivotally connected at an angle to one another such that upon pivoting of the two rods of each of the units, the ends are all moved in parallel relationship to one another. A rigid yoke carries the framework and includes a pair of legs, each of the units being pivotally connected to a stationary point on one yoke leg and pivotally connected to a member movable along a yoke leg.

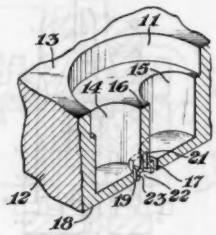
3,659,983

SPINNERETTE FOR THE PRODUCTION OF HOLLOW FIBERS

Earl A. McLain, and Henry I. Mahon, both of Walnut Creek, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 19, 1969, Ser. No. 800,504
Int. Cl. D01d *3/00*
U.S. Cl. 425—72 5 Claims

A spinnerette for producing hollow fibers and particularly for producing fine bore, uniform permeable hollow fibers useful as the separation membrane in reverse osmosis, ultrafiltration, etc. is disclosed. The spinnerette combines a unique molten polymer passageway and gas passageway to supply an inert gas to the center of the hollow fiber as it is extruded from the orifice.

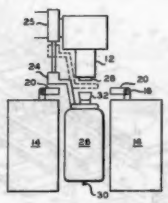


3,659,984

RECIPROCAL FLUID NOZZLE FOR COOLING PARISON

Anthony J. Krstolic, Kansas City, Kans., assignor to Phillips Petroleum Company

Filed Dec. 5, 1969, Ser. No. 882,606
Int. Cl. B29d *23/03*
U.S. Cl. 425—72 4 Claims



In a blow molding machine, a nozzle for directing a stream of fluid such as air is attached to each mold half. On closing the molds, the nozzles move into position adjacent the parison and air is impinged on the portion of the parison between the top of the mold and the die. Thereafter, the air is discontinued and the air nozzles retracted with the mold halves to allow a stripper mechanism to tear the finished article free from the die.

3,659,985

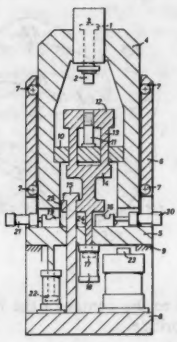
PRESSES

Alec Frank Marshall, Solihull, and Hugh Gordon Taylor, Birmingham, both of England, assignors to The Birmingham Small Arms Company Limited, Birmingham, England

Filed Dec. 9, 1969, Ser. No. 883,404
Claims priority, application Great Britain, Dec. 13, 1968, 059,302/68; Mar. 15, 1969, 13,723/69
Int. Cl. B30b *11/02*
U.S. Cl. 425—78 5 Claims

A machine for compacting metal powder comprises a static frame, a die having a bore, a lower punch defining a receiving die cavity in the bore, an upper punch, an upper punch downwardly movable to enter the die cavity, and a reaction frame to which the lower punch is fixed slidably mounted on the static frame, the reaction frame and the lower punch being moved upwardly by a reaction force generated when the upper punch is moved downwardly. The die is moved upwardly after the die cavity has been filled

with powder a distance at least equal to the upward movement of the lower punch completed before the upper punch



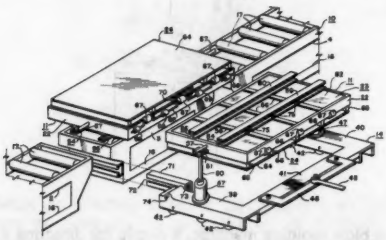
enters the die cavity, and the die is moved downwardly after the upper punch has entered the die cavity.

3,659,986

APPARATUS FOR MAKING CONCRETE PRODUCTS

Nathan L. Gelbman, 17201 N.E. Fourth Avenue, North Miami Beach, Fla.

Filed Mar. 16, 1970, Ser. No. 19,638
Int. Cl. B28b *15/00*
U.S. Cl. 425—88 12 Claims



An apparatus for mass producing large concrete products, in assembly line manner, on a floor mounted conveyor system, with which various operations are performed at different stations along the conveyor. A sectional mold, for casting purposes, is prepared at a first station and then moved forward. At a second station on the conveyor, the mold is vibrated and filled with concrete, and then moved forward. At a third station, the concrete is completely sealed within the mold, and the mold is elevated, removed from the conveyor, rotated 180°, returned to the conveyor, and stripped from the casting. The casting is then moved along on the conveyor for storage.

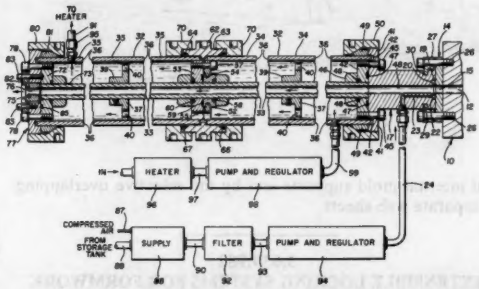
3,659,987

APPARATUS FOR FORMING AND CURING CONTINUOUS ELASTOMERIC STRIP

Ronald G. Mixell, Muncie, Ind., and Daryl D. Cerny, Greenville, Ohio, assignors to Ball Corporation, Muncie, Ind.

Original application Nov. 23, 1966, Ser. No. 596,582, now Patent No. 3,517,097. Divided and this application Dec. 24, 1969, Ser. No. 889,828
Int. Cl. B29f *3/04*
U.S. Cl. 425—97 4 Claims

Continuously molding heat curable thermoplastic material into a strip of definite desired cross-section shape and area with means including a cure die in the form of an elongated tube having an entrance end and an exit end and a cross-section similar in shape to the desired shape and greater in area than the cross-sectional area of the desired strip, said cure die including heating means, an extrusion die spaced from the entrance end of said tube and having a cross-sectional



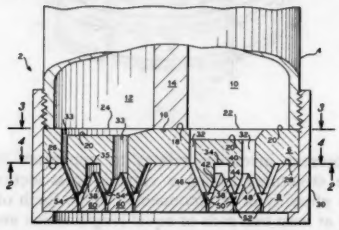
area less than the cross-sectional area of said cure die but greater than or equal to the desired cross-sectional area of the strip, a lubricating die including means for dispensing lubricant upon said strip, said lubricating die connecting said forming die with said entrance end of said cure die and having a passageway defined therein with a cross-sectional area greater than the cross-sectional area of said cure die.

3,659,988

BICOMPONENT DISTRIBUTION PLATE OF A SPINNERET ASSEMBLY

Zbigniew K. Walczak, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Feb. 18, 1970, Ser. No. 12,389
Int. Cl. D01d *3/00*
U.S. Cl. 425—131 5 Claims



A spinneret distribution plate having a plurality of grooves and associated openings for concentrically distributing separate rings of two different fluids.

3,659,989

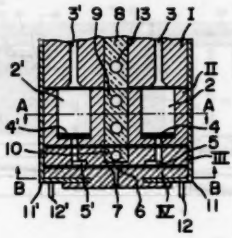
APPARATUS FOR IMPROVING SPINNABILITY AND PROPERTY OF COMPOSITE FILAMENT

Toru Uraya, Kobe City, and Shusuke Kageyama, Osaka, both of Japan, assignors to Kanegafuchi Boseki Kabushiki Kaisha, Tokyo, Japan

Continuation of application Ser. No. 568,016, July 26, 1966, now Patent No. 3,536,802, dated Oct. 27, 1970. This application June 19, 1970, Ser. No. 47,862
Claims priority, application Japan, Aug. 2, 1965, 40/47078; July 15, 1966, 41/46271
Int. Cl. D01d *3/00*
U.S. Cl. 425—131 7 Claims

Method and apparatus for spinning a composite filament wherein two polymers having different melt viscosities are

melted separately and the temperature of each maintained so that the melt viscosity ratio of the molten polymers is 0.4 to 2.5 until extrusion. The apparatus includes means for controlling the temperatures of the two spinning melts separately and retarding transmission of heat between the melts until they are extruded together.



3,659,990

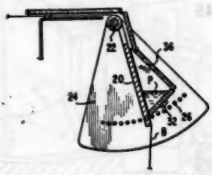
APPARATUS FOR CASTING A FILM

Russel L. Cate, Jr., Raleigh, N.C.; Percy D. Leonard, Jr., U. S. Air Force, and Robert D. Smith, Raleigh, N.C., assignors to Corning Glass Works, Corning, N.Y.

Original application Mar. 28, 1967, Ser. No. 626,560, now abandoned. Divided and this application Nov. 7, 1969, Ser. No. 874,951

Int. Cl. B29d *7/02*

U.S. Cl. 425—141 3 Claims



The apparatus for containing the pool of coating material is mounted on a pivoted backing plate which is arranged for a pivotal movement between two side plates. A slot is provided at the bottom of the pool to allow a strip of material to enter the bottom of the pool and travel upwardly along the backing plate and over considerable guide means adjacent the pivot point for the backing plate. Adjustable stops are provided for holding the backing plate at various angles relative to the vertical so that as the strip of material passes through the pool along the backing plate the amount of coating material picked up by the strip of material will vary depending upon the angle of the backing plate.

3,659,991

CLAMPING FRAME FOR PLASTIC VACUUM FORMING MACHINE

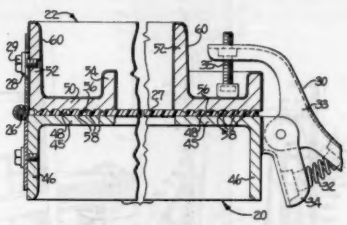
Harvey J. Diamond, Charlotte, N.C., assignor to Plasti-Vac, Inc., Charlotte, N.C.

Filed Apr. 3, 1970, Ser. No. 25,349

Int. Cl. B29c *17/04*

U.S. Cl. 425—174 5 Claims

A clamping frame for a plastic vacuum forming machine which includes upper and lower clamping members connected by hinges for supporting a plastic sheet during the heating and forming operations and which are constructed to facilitate the clamping of the plastic sheet. Also, a substantial portion of the surface of at least one of the clamping members is coated with a heat absorbing material such that its temperature rises to a higher level than would otherwise be the case.



3,659,992

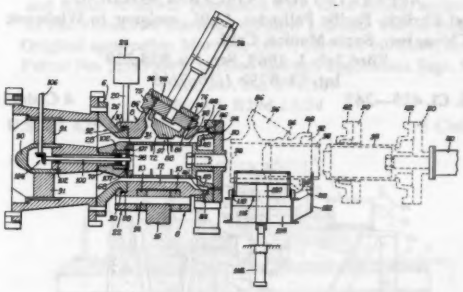
EXTRUDING FITTINGS

Bernard A. Greene, Gray, Ga., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Oct. 7, 1968, Ser. No. 765,378

Int. Cl. B28b *21/52*

U.S. Cl. 425—192 5 Claims



A die, engageable with a clay extruding machine, has a given interior configuration corresponding to the out-side configuration of a pipe fitting. A pair of spaced mandrels are inserted through openings in the die and define a branch opening and a main opening therein. A centrifugal cutting blade is rotatably mounted proximate to the main mandrel and is usable to sever the clay in the die from the extruding machine. A circular cutter is also mounted proximate the die to cut away extruded clay left in the space between the branch opening and the main opening.

3,659,993

APPARATUS FOR FORMING CONTAINERS

Fred P. Brown, Jr., Centerville, Mass., assignor to Packaging Industries, Inc., Hyannis, Mass.

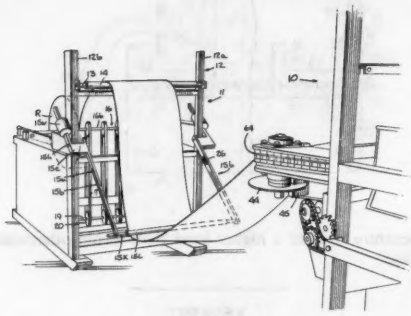
Filed Oct. 24, 1969, Ser. No. 869,249

Int. Cl. B29c *17/02*

U.S. Cl. 425—214 5 Claims

Apparatus for forming containers from webs of plastic material is disclosed as including a forming machine and a web tensioning and feeding apparatus. The web tensioning and feeding apparatus feeds the plastic material to the forming machine in accordance with the consumption of plastic material by the forming machine and maintains a relatively constant tension in the plastic fed to the forming machine. The forming machine forms containers from the plastic material and includes printing apparatus for printing on the formed containers. The printing apparatus includes a platen

with a roller adapted to be rolled on the platen to ink the platen so it can subsequently print on the container. Means are provided for disengaging the forming, blanking and printing devices from the main power drive and bringing these devices to a complete and instantaneous halt even while the motor is running.

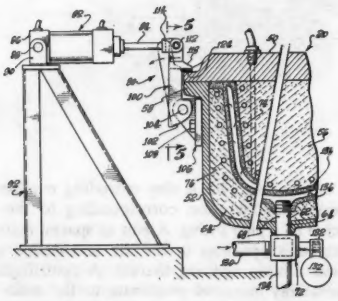


3,659,994

APPARATUS FOR INJECTION MOLDING

Josef Ehrlich, Pacific Palisades, Calif., assignor to Winbrook China, Inc., Santa Monica, Calif.

Filed July 1, 1969, Ser. No. 838,229
Int. Cl. B29b *1/26, 7/16*
U.S. Cl. 425—242 **4 Claims**



Injection molding apparatus for molding articles, particularly ceramic articles. The injection molding takes place at high pressure. Particular clamping means are provided to clamp the cover or top on the mold while injecting at high pressure. Particular means are provided for handling the molds and for removing the top or cover of the carrier and for removing the finished piece. The mechanism facilitates handling of the molds and makes possible rapid and repeated use of the molds and thereby greatly augments their utility.

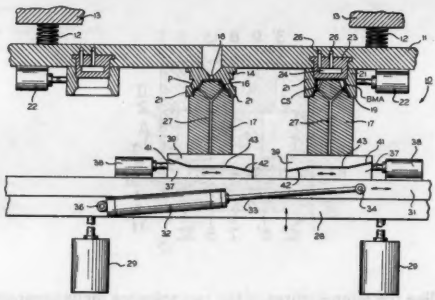
3,659,995

COINING STRUCTURES FOR INJECTION-BLOW MOULDING APPARATUS

Pascal A. La Grutta, West Caldwell, N.J., assignor to Container Corporation of America, Chicago, Ill.

Filed Dec. 17, 1969, Ser. No. 885,721
Int. Cl. B29d *23/03*
U.S. Cl. 425—242 **1 Claim**

An injection-blow moulding apparatus characterized by structure at the blow moulding station for coining a surface of the blown parison before it is removed from the blow mould cavity. The coining step is achieved by cooperating cam members, one being fixed to the moving stack of the apparatus, and the other cam member being movable relative to such stack.

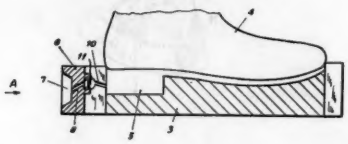


3,659,996

DEVICE FOR THE INJECTION MOLDING OF EXPANDABLE PLASTIC MASSES

Ernst Schwarz, Pottschach, and Peter Scherz, Kottlach, both of Austria, assignors to SEMPERIT Osterreichisch-Amerikanische Gummiwerke Aktiengesellschaft, Wien, Austria

Filed Feb. 19, 1970, Ser. No. 12,669
Claims priority, application Austria, Feb. 20, 1969, A 1739/69
Int. Cl. B29f *1/03*
U.S. Cl. 425—245 **6 Claims**



A device for the injection molding of expandable plastic masses, such as foamable synthetic substances through an injection conduit having a valve seat into an injection mold. A valve body is exchangeably inserted into the injection conduit after which the mold is filled therethrough, the plastic mass then flows past the valve body where, upon the termination of the molding process, the valve body is pressed into a closed position against the valve seat by the internal pressure of the mold thereby effectively sealing said conduit against outflow of any of said injection material.

3,659,997

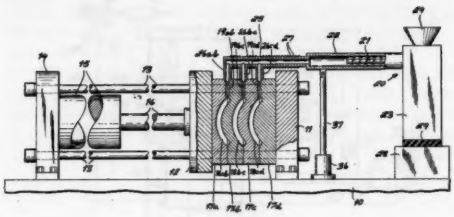
INJECTION-MOLDING MACHINE WITH TRANSVERSE FEED

Herbert Rees, Toronto Willowdale, Ontario, Canada, assignor to HUSKY Manufacturing & Tool Works Limited, Toronto, Ontario, Canada

Filed Mar. 4, 1970, Ser. No. 16,442
Int. Cl. B29f *1/00*
U.S. Cl. 425—247 **4 Claims**

An injection-molding machine with a set of stacked mold plates, defining several axially spaced mold cavities therebetween, includes an injection unit with one or more nozzles movable perpendicularly to the stack for contact with respective inlets, leading to the several cavities, which are

aligned with these nozzles in the closed position of the multiple mold. The mold plates may be interconnected by a



lazytong linkage or by lost-motion couplings for proper relative spacing in the open mold position.

3,659,998

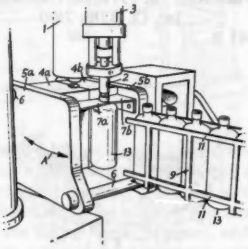
BLOW-MOLDING MACHINES

Ronald G. Saffron, London, England, assignor to Hayssen Manufacturing Company, Sheboygan, Wis.

Filed May 25, 1970, Ser. No. 41,135

Int. Cl. B29c *17/07*

U.S. Cl. 425—326 **4 Claims**



A machine for blow-molding hollow articles has an extruder and a blowing mandrel spaced along the direction of feed of blown moldings, and a track for blown bottles also spaced in the same direction from the blowing mandrel. An assembly of openable die halves and grippers are reciprocable in unison along the feed path between a first station in which they are aligned respectively with the extruder and blowing mandrel, and a second station in which they are aligned respectively with the blowing mandrel and the track. During each cycle of movement of the die halves and grippers, (i) a parison is moved from the extruder to the blowing mandrel, (ii) a blown molding is moved from the blowing mandrel to the track, and (iii) the previous blown molding is shifted along the track. A device is included to exhaust the blown molding more rapidly, and/or to retain it on the blowing mandrel temporarily by suction.

3,659,999

APPARATUS FOR MOLDING CONTAINER PARTS

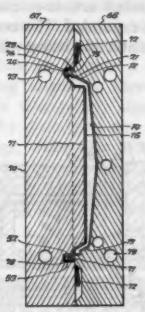
Peter T. Schurman, Woodbridge, Conn., assignor to The Plastic Forming Company, Inc., Woodbridge, Conn.

Filed Feb. 9, 1970, Ser. No. 9,529

Int. Cl. B29d *23/03*

U.S. Cl. 425—326 **5 Claims**

A plastic container having blow-molded cover and body parts and compression molded interfitting hinge parts formed



integral therewith providing hinge pin bearing sections of double-wall thickness. A latch also is provided.

3,660,000

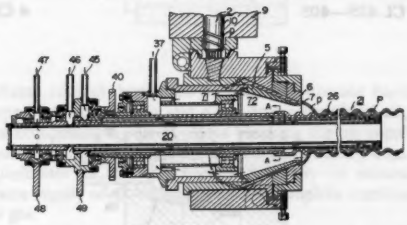
APPARATUS FOR THE CONTINUOUS MANUFACTURE OF CORRUGATED PLASTIC PIPES BY EXTRUDING

Tsunemi Yoshida, Tokyo; Koichi Ishikawa; Masatoshi Ando, both of Yokohama City; Yoshihiko Ueno, Kawagoe City, and Kunio Arisawa, Yokohama City, all of Japan, assignors to The Furukawa Electric Company Limited, Tokyo, Japan

Original application Mar. 20, 1967, Ser. No. 624,584, now Patent No. 3,529,047. Divided and this application Sept. 9, 1969, Ser. No. 871,107

Int. Cl. B29d *23/04*

U.S. Cl. 425—327 **5 Claims**



An apparatus for continuous manufacture of helically corrugated plastic pipe from extruded tubing utilizing differential pressure. Thermoplastic material is extruded in a molten state in the form of a tube and the tube is passed over a helically corrugated surface of either an internal mandrel or an external mandrel. A vacuum is supplied between the surface of the cylindrical body and the inside surface of the tube to conform the tube to the surface of the body. A pressure differential is maintained inside the formed pipe, a vacuum being used with the internal mandrel and a pressure with the external mandrel. The cylindrical body is rotated to advance the extruded tube formed thereabout and a cooling fluid is circulated through the cylindrical body to cool the tube as it it formed against the body.

3,660,001

MOLDING APPARATUS WITH POSITIVE COLLAPSE CORE

George L. Roehr, 225 Crescent Street, Lincoln, Mass.

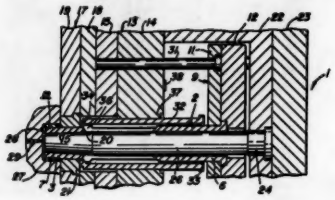
Filed Nov. 6, 1968, Ser. No. 773,817

Int. Cl. B29f *1/14*

U.S. Cl. 425—396 **7 Claims**

Apparatus for molding plastic articles having an undercut, rib, thread, or the like deformation comprises a core divided

longitudinally into sections having molding ends that are radially shiftable to and from an expanded article-molding position and a contracted article-release position. A center pin holds the sections expanded. The core may be shifted axially resulting in the center pin being withdrawn from support



of the molding ends of the sections. This causes a cam ring that encircles the sections to urge the sections radially inwardly by the engagement of cam-follower lugs on the sections to collapse positively the sections without interference from the pin.

3,660,002

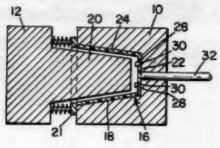
APPARATUS FOR MOLDING OPEN CONTAINERS

Peter J. Morroni, c/o Clearshield Plastic Co., Florence Street, Leominster, Mass.

Filed Sept. 25, 1969, Ser. No. 861,083

Int. Cl. B29f 1/14; B29c 7/00

U.S. Cl. 425—405 **4 Claims**



In the ejection of molded open-top containers from a plastic injection molding die, that improvement which comprises holding the just molded container in the cavity as the mold opens and blowing air onto the exterior of the bottom of the molded container in a direction to force the container out of the cavity.

3,660,003

APPARATUS FOR THE MANUFACTURE OF HOLLOW FRANGIBLE PIPES

Philip Waddington, 839 Provost Drive, Ottawa 10, Ontario, Canada

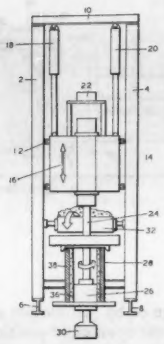
Filed Apr. 28, 1970, Ser. No. 32,693

Claims priority, application Canada, May 8, 1969, 050,591

Int. Cl. B28b 21/32

U.S. Cl. 425—427 **6 Claims**

The invention is concerned with the manufacture of hollow frangible pipes and contemplates the provision of an automatic pipe-making apparatus of the packer head or roller head type, including means for adjusting the rate of lift of the packer shaft means for varying the rate of feed of the material from which the pipe is to be formed and means for relating these two variable rates in a manner such that the pipes



formed thereby are uniformly packed to the optimum density throughout their length.

3,660,004

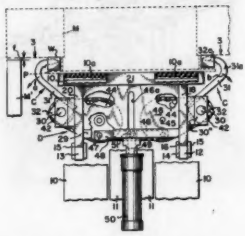
PALLET CLAMP

Robert J. Woelk, Alpena, Mich., assignor to Besser Company, Alpena, Mich.

Filed Apr. 30, 1970, Ser. No. 33,248

Int. Cl. B28b 7/00

U.S. Cl. 25—41 R **13 Claims**



Concrete block molding machinery having apparatus for moving a block receiving pallet against a mold assembly which is used in forming building blocks. The apparatus includes rotatable clamp arms and clamp receiving members having cooperating wedging surfaces, the clamp arms being movable into and out of engagement with the clamp receiving members to move the pallet supporting members toward and away from the mold assembly to clamp and unclamp the pallet to and from the mold.

3,660,005

FAIL-SAFE ELECTRIC IGNITION SYSTEMS

James R. Willson, Garden Grove, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

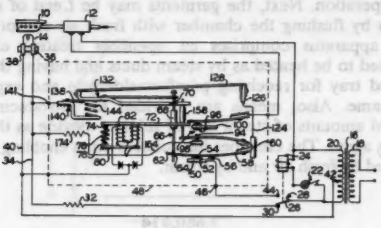
Filed June 12, 1970, Ser. No. 45,645

Int. Cl. F23n 5/00

U.S. Cl. 431—66 **37 Claims**

Electric ignition systems utilizing a holding coil in parallel with an electric igniter having a temperature responsive resistance, a heat expansible wire in series with the igniter, first and second switches controlled by the coil and the wire, respectively, to control the operation of a fuel valve, a dropping resistor to maintain the igniter at least partially

energized at all times, and a flame proving network for partially deenergizing the igniter after ignition whereby the system assumes a fail-safe state in response to burner flame outage or any electrical or mechanical failure.



3,660,006

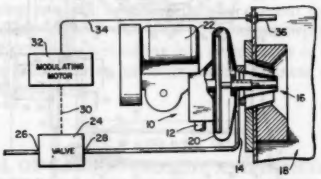
POLLUTION PREVENTIVE BURNER SYSTEM

David Crosta, 16 Woodland Avenue, Pompton Plains, N.J.

Filed Dec. 14, 1970, Ser. No. 97,629

Int. Cl. F23d *11/04*

U.S. Cl. 431—168 **12 Claims**



Disclosed herein is a burner system for use with boilers and furnaces, including a rotary cup burner having a combustion chamber and means for igniting a fuel oil and air mixture discharged into the chamber by a rotary cup nozzle. The fuel oil is supplied to the burner under pressure, and its flow rate is controlled by an automatically operated valve. Actuation of the valve is effected by a modulating motor, which, in turn, is controlled by a thermostat coupled to the furnace or boiler. The valve comprises a housing having inlet and outlet ports, and includes a valve chamber therewithin having triangularly shaped openings communicating with the inlet and outlet ports. A valve member is rotatably disposed within the chamber and linked for movement to the modulating motor. The valve member takes the form of a cylinder having a cutout portion extending angularly thereof for imparting a shearing action at the triangularly shaped openings in the valve chamber, thereby dislodging any sediment which may collect at the openings, while also providing an accurately controlled flow of oil due to the adjustable position of the angular edge of the valve member with respect to the converging edges of the triangularly shaped chamber openings.

3,660,007

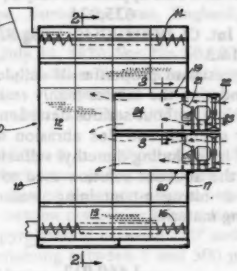
PROFILE PLATES FOR BURNER

Erhard E. Alms, Barrington, and James E. Mitchell, Cary, both of Ill., assignors to AFE Industries, Inc., Lake Zurich, Ill., by said Mitchell

Filed May 4, 1970, Ser. No. 34,487

Int. Cl. F23d *15/00*

U.S. Cl. 431—351 **3 Claims**



A flame control device for a cylindrical furnace having a T-shaped gas burner unit and a fan-driven supply of air, the device comprising a pair of plates blocking the air supply to the burner except for a uniform area immediately adjacent the perimeter of the gas burner, whereby to ensure an adequate supply of air at the burner for complete combustion of the gas.

CHEMICAL

3,660,008

DYEING SULFONATED ANIONIC POLYMERIC FIBERS WITH AN AQUEOUS DISPERSION OF A SALT OF A CATIONIC DYE AND AN ARYLSULFONATE

Erik Kissa, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 25, 1968, Ser. No. 724,239

Int. Cl. D06p *3/82*

U.S. Cl. 8—21 A **13 Claims**

An aqueous dispersion of (1) a water-insoluble salt of a cationic dye and a selected anion of an arylsulfonic acid with (2) an anionic dispersing agent selected from lignin sulfonate or a salt of a sulfonated naphthalene-formaldehyde condensate has been found useful in the high-temperature dyeing of acid modified acrylic, polyamide, or polyester fibers, either alone or in blend by continuous dyeing operations.

The salts can be represented by the formulas $D^{\oplus}\ Ar'SO_3^{\ominus}$ and $K^{\oplus}\ ArSO_3^{\ominus}$ where $D^{\oplus}$ is a cationic dye having a resonating or delocalized positive charge and Ar' is an aryl group substituted with substituents such that the summation of the pKa increments for the substituents is equal to or less than -0.9; and $K^{\oplus}$ is a cationic dye having a localized positive charge and Ar is an aryl group substituted with substituents such that the summation of the pKa increments for the substituents is equal to or less than -0.6.

3,660,009

METHOD OF MANUFACTURING READY-TO-WEAR CREASE-RESISTIVE GARMENTS

Frederick H. Sexsmith, Erie, Pa., assignor to Millmaster Onyx Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 491,009, Sept. 28, 1965, now abandoned. This application Feb. 2, 1969, Ser. No. 821,512

Int. Cl. D06m *15/10, 15/44*

U.S. Cl. 8—116 **8 Claims**

Crease-resistant properties are imparted to wash-and-wear garments by impregnating cellulosic textile fabrics with a solution of a polymeric acetal obtained by reacting formaldehyde and a polyol, together with an acid catalyst, and thereafter drying and forming a garment from the fabric, and

pressing the same, the pressed finished garment then being subjected to a prolonged cure which imparts crease resistance to the garment.

3,660,010

TREATING TEXTILES WITH SOIL RELEASE AGENTS

Paul C. Georgoudis, Dunellen, and Dilip K. Ray-Chaudhuri, Somerset, both of N.J., assignors to National Starch and Chemical Corporation, New York, N.Y.

Filed Dec. 17, 1969, Ser. No. 886,031
Int. Cl. D06m *15/12*; **B32b** *27/40*
U.S. Cl. 8—115.6 **2 Claims**

A process of treating textiles with soil release agents to impart soil release properties thereto, said soil release agents being water soluble, hydroxyl terminated polyurethanes.

3,660,011

DIMETHYL SULFOXIDE USED AS A SOLVENT FOR TEXTILE TREATING COMPOSITIONS

Fred B. Shippee, and Domenick Donald Gagliardi, both of East Greenwich, R.I., assignors to Gagliardi Research Corporation, East Greenwich, R.I.

Continuation of application Ser. No. 332,799, Dec. 23, 1963, now abandoned. This application May 3, 1967, Ser. No. 635,924
Int. Cl. D06m *13/40*; **C08g** *51/46*
U.S. Cl. 8—116.3 **8 Claims**

The crease resistant properties of cellulosic fabrics is improved by rendering the fabrics highly resistant to both wet and dry wrinkling without serious detriment to fabric tensile strength, tear strength and flex abrasion resistance. This is accomplished by including dimethyl sulfoxide as an essential ingredient in the aqueous solution used to treat a cellulosic fabric with a nitrogen-containing water-soluble organic crease-proofing material.

3,660,012

SELECTIVE ETHYLATION OF THE CELLULOSE MOLECULE

John G. Roberts, Cheadle Hulme, England, assignor to The United States of America as represented by the Secretary of Agriculture

Filed Sept. 4, 1970, Ser. No. 69,865
Int. Cl. D06m *15/58, 11/04, 13/02*
U.S. Cl. 8—116.3 **1 Claim**

This invention relates to a process for the selective ethylation of cellulosic fibers. More particularly, this invention relates to a process for the selective ethylation of cellulosic fibers and a subsequent crosslinking of said fabrics to produce fabrics with improved crease recovery and abrasion resistance.

3,660,013

METHOD AND APPARATUS FOR PRODUCING A DURABLE PRESS IN GARMENTS CONTAINING CELLULOSE OR CELLULOSIC DERIVATIVES

George Louis Payet, and John H. Forg, both of Cincinnati, Ohio, assignors to McGraw-Edison Company, Elgin, Ill.

Filed Aug. 1, 1969, Ser. No. 846,884
Int. Cl. D06m *1/16, 13/14, 13/54*
U.S. Cl. 8—116.4 **9 Claims**

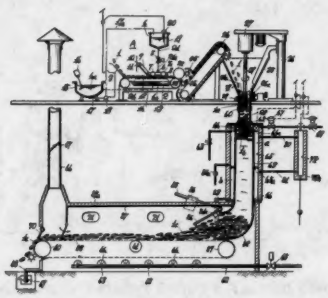
A novel treating method and commercial apparatus for carrying out this method have been developed for reacting prepressed cellulosic and cellulosic-blend garments with cross-linking agents in a gaseous phase to impart a durable press thereto. The durable press finish is imparted by placing the garments in a closed chamber typically at room temperature from 70°F to 80°F or, if preheated, at a temperature not in excess of 150°F, adding formaldehyde gas and sulphur dioxide gas and steam for several minutes causing the temperature in the chamber to rise due to the steam, cutting off the steam and allowing the temperature to drop to saturate the atmosphere and cause greater condensation of steam through the garments, and then heating the chamber to a temperature of the order of 250°F to complete the crosslinking operation. Next, the garments may be freed of residual odors by flushing the chamber with fresh air and/or steam. The apparatus comprises an openable treating chamber adapted to be heated as by steam ducts and having therein a heated tray for receiving paraformaldehyde and vaporizing the same. Also, means are provided for introducing controlled amounts of steam and of sulphur dioxide as the catalyzing agent. The chamber has suitable ports enabling it to be flushed by fresh air and by steam.

3,660,014

CONTINUOUS STEAM-HEATING METHOD AND APPARATUS FOR CONTINUOUSLY TREATING OR DYEING COTTON AND OTHER FIBERS

Shoichi Ohya, Sakai, Japan, assignor to Kabushiki Kaisha Yamadakuma Senkojo, Osaka, Japan

Filed Oct. 29, 1970, Ser. No. 85,033
Claims priority, application Japan, Jan. 10, 1970, 45/3035
Int. Cl. D06p *5/02, 7/00*
U.S. Cl. 8—149.1 **3 Claims**



A method of continuously treating or dyeing cotton and other fibers and an apparatus therefor, comprising a mechanism whereby cotton and other fibers are saturated uniformly with a dye liquor or a treating liquor and are fed to a fiber-receiving pipe having a steeply sloped inner surface, a pressing mechanism whereby cotton and other fibers are pressed into the cotton-receiving pipe intermittently in the state of layers, a cylindrical steam-heater provided below the fiber-receiving pipe, a mechanism whereby a sealing force is imparted to the lower end of said steam-heater, and a horizontal steam-heater for the secondary steam-heating.

3,660,015

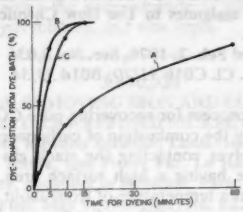
PROCESS FOR THE DYEING OF MODIFIED POLYESTER FIBERS WITH BASIC DYES IN THE PRESENCE OF AROMATIC CARBOXYLIC ACIDS

Minoru Ozutsumi; Kazuo Kawakami, and Sumio Ishizaki, all of Tokyo, Japan, assignors to Hodogaya Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

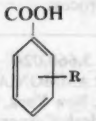
Filed Jan. 24, 1969, Ser. No. 793,755
Int. Cl. D06p *5/04*
U.S. Cl. 8—173 **4 Claims**

This invention provides a novel process for the dyeing of fibrous materials such as yarn, filaments and textile fabrics made of modified synthetic polyesters which contain a sul-

fonate radical, or blended yarn fabrics or union cloths containing said fibrous materials of modified polyester with basic



dyestuffs in a dye bath containing at least one of the aromatic carboxylic acids represented by the general formula



wherein R denotes a hydrogen atom or radical selected from the group consisting of hydroxyl and carboxyl groups serving as dyeing accelerator.

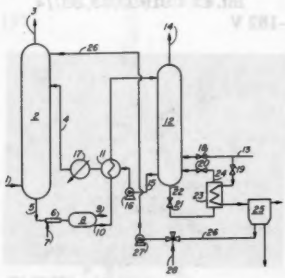
The dyeing process according to the present invention is advantageously carried out with a rapid adsorption of the dyestuff from dye bath resulting in a deep shade of coloration on the materials having an outstanding fastness properties especially light-fastness.

3,660,016

REMOVAL OF CARBON DIOXIDE AND/OR HYDROGEN SULFIDE FROM GASES CONTAINING OLEFINES AND ACETYLENES

Harald John; Rolf Luehdemann, both of Ludwigshafen; Wilhelm Rittinger, Schifferstadt; Artur Sliwka, Krichheim, and Walter Saum, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhein, Germany

Filed Dec. 16, 1968, Ser. No. 783,907
Claims priority, application Germany, Dec. 15, 1967, P 16 43 715.3
Int. Cl. B01d *53/34, 53/16*
U.S. Cl. 23—2 R **6 Claims**



A process for the removal of CO_2 and/or H_2S from gases containing olefins and acetylenes by absorption in an aqueous solution of an alkali metal salt of amino acid and desorption by decompressing and heating the solvent, which comprises treating the solvent, before or after desorption, with a hydrocarbon mixture substantially consisting of benzene for the purpose of removing impurities and, after said treatment, separating the hydrocarbon mixture from the aqueous solution.

3,660,017

ABSORPTION AND HYDROLYSIS OF CARBON OXYSULFIDE

Wolfgang Hoesberg, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 28, 1969, Ser. No. 819,959
Int. Cl. B01d *53/34*
U.S. Cl. 23—2 R **8 Claims**

Carbon oxysulfide is hydrolyzed with water at a temperature of at least 100° C. in the presence of an N-substituted alkanolamine or ether of the formula

$$R-NH(CH_2)_n-OR_1$$

where R is a saturated alkyl or cycloalkyl radical of 1 to 20 carbon atoms; R_1 is hydrogen or a saturated alkyl radical of 1 to 4 carbon atoms; and n is an integer of 2–4. The process can be carried out in a continuous manner, water being introduced into the system at about the same rate as carbon oxysulfide is decomposed.

3,660,018

METHOD OF MANUFACTURING CARBON FIBRE

Philip George Rose, Burton-on-Trent, England, assignor to Rolls Royce Limited, Derby, England

Filed July 31, 1970, Ser. No. 60,103
Claims priority, application Great Britain, Aug. 4, 1969, 38,868/69
Int. Cl. C01b *31/07*
U.S. Cl. 23—209.4 **5 Claims**

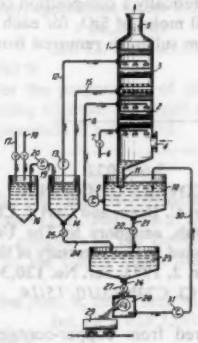
The invention relates to a method of manufacturing improved carbon fibre from polyacrylonitrile in which the polyacrylonitrile is heated to a temperature between 150° C. and 300° C. in an oxygen containing atmosphere to stabilize its structure, then pyrolysed at between 700° and 1,500° C. in an atmosphere containing between 5 and 500 parts per million of oxygen and being otherwise inert.

3,660,019

PROCESS FOR PURIFYING INDUSTRIAL WASTE GASES CONTAINING FLUORINE VALUES

Hans H. Predikant, Hailer; Hermann Betz, Neuenhablau, and Johann Schaffer, Meerholz, all of Germany, assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Jan. 29, 1970, Ser. No. 6,791
Claims priority, application Germany, Feb. 1, 1969, P 19 05 080.7
Int. Cl. C01d *3/02*
U.S. Cl. 23—88 **6 Claims**



Fluorine values are recovered from industrial waste gases containing fluorine and/or hydrogen fluoride, notably from

gases evolved in the manufacture of aluminum through electrolysis of alumina in the presence of cryolite, by scrubbing with a highly acidic aqueous solution containing hydrogen fluoride in a first washing zone and then with an aqueous sodium hydroxide solution with formation of sodium fluoride in solution without precipitation in a second washing zone, splitting the stream of solution from each washing zone into a recycle stream for return to the zone wherein it was formed, and into a precipitation stream, and the two precipitation streams are combined to precipitate sodium fluoride, which is recovered with recirculation of resultant mother liquor to the first washing zone.

3,660,020

PROCESS FOR THE SEPARATION OF IMPURITIES FROM NICKEL CHLORIDE SOLUTIONS

Louis Gandon; Christian Bozec, and Philippe Lenoble, all of Le Havre, France, assignors to Le Nickel, Paris, France

Filed Aug. 7, 1970, Ser. No. 62,190
Claims priority, application France, Aug. 12, 1969, 6922701
Int. Cl. C01g *53/08*
U.S. Cl. 23—87 R **8 Claims**

A process for the separation of metallic impurities, from aqueous nickel chloride solutions by selective liquid/liquid extraction between said aqueous phase containing the said metallic impurities in chloride form and an organic phase containing a trialkyl sulfonium chloride in the form of a solution in an organic diluent substantially immiscible with water, such that at least one of the said metallic valuables is selectively transferred from the aqueous phase to the organic phase, characterized by the fact that the said aqueous phase is substantially neutral and that it presents a total concentration in chloride ions equal at least to 7 gram equivalents/liter.

3,660,021

PREPARATION OF FINELY DIVIDED CALCIUM SILICATE

Lester E. Olmsted, Affton; Eckard J. Puetz, Lemay; Warren Rodgers, St. Louis, and Charles R. Trampier, Jr., Webster Groves, all of Mo., assignors to N L Industries, Inc., New York, N.Y.

Filed Sept. 29, 1970, Ser. No. 76,584
Int. Cl. C01b *33/24;* **C01d** *5/00*
U.S. Cl. 23—110 R **5 Claims**

A new type of finely divided calcium silicate has been produced by reacting calcium sulfate with sodium silicate an amounts to form theoretically a composition containing from about 0.7 to about 4.0 moles of SiO_2 for each mole of CaO. The by-product sodium sulfate is removed from the calcium silicate by washing.

3,660,022

RECOVERY OF COPPER

Walter L. Staker; Karl C. Dean, and Carl J. Chindgren, all of Salt Lake City, Utah, assignors to The United States of America as represented by the Secretary of the Interior

Filed Mar. 2, 1971, Ser. No. 120,360
Int. Cl. C22b *15/10, 15/14*
U.S. Cl. 23—135 **3 Claims**

Copper is recovered from copper-containing materials, such as scrap or ores, by leaching with cupric ammonium carbonate solution, followed by addition of elemental sulfur to precipitate copper sulfide and regenerate the cupric ammonium carbonate leach solution.

3,660,023

PROCESS FOR RECOVERING CARBON DIOXIDE FROM STACK GAS

Ludo K. Frevel, Midland, and Leonard J. Kressley, Saginaw, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 2, 1970, Ser. No. 8,036
Int. Cl. C01b *31/20;* **B01d** *53/34*
U.S. Cl. 23—150 **8 Claims**

Disclosed is a process for recovering pure CO_2 from stack gases produced by the combustion of carbonaceous material. The process involves contacting the stack gas with porous sodium carbonate having a high surface area, i.e., greater than 0.3 m^2/gm. at a temperature of from about 40° to 75° C. Interaction between moist CO_2 and sodium carbonate forms $3NaHCO_3 \cdot Na_2CO_3$ which upon heating to a temperature of from 150° to 250° C. decomposes into CO_2, H_2O and Na_2CO_3. The liberated CO_2 is readily recovered and the regenerated Na_2CO_3 can be used to recover additional CO_2 thus permitting a cyclic process.

3,660,024

PROCESS FOR AMMONIA OXIDATION

George Richard Gillespie, New York, N.Y., assignor to Engelhard Minerals & Chemicals Corporation

Continuation-in-part of application Ser. No. 2,255, Jan. 12, 1970, now abandoned. This application Sept. 11, 1970, Ser. No. 71,560
Int. Cl. C01b *21/26*
U.S. Cl. 23—162 **5 Claims**

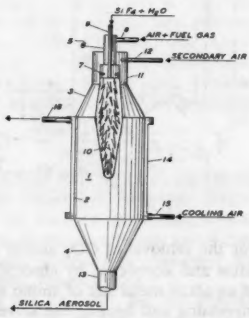
In an ammonia oxidation process wherein ammonia and an oxidizing gas are contacted with a multilayer pad of platinum metal catalyst, a method is provided for reducing the amount of platinum metal catalyst required. The optimum amount of catalyst needed for a 95 percent ammonia conversion is reduced by replacement of a significant fraction of the gauze with a non-precious metal corrosion resistant foraminous structure which simulates the flow resistance of the fraction of catalyst gauze removed from the optimum pad. The resulting catalyst pack comprising platinum metal gauze and foraminous structure is equivalent in ammonia conversion to the optimum pad and the volatilization of the platinum metal gauze is materially reduced.

3,660,025

MANUFACTURE OF PIGMENTARY SILICA

Richard E. Driscoll, Monroe, La., assignor to Cities Service Company, New York, N.Y.

Filed July 1, 1970, Ser. No. 51,632
Int. Cl. C01b *33/18, 33/14*
U.S. Cl. 23—182 V **9 Claims**



A mixture of fluid fuel and oxygen is burned at a substantially constant rate to produce hot flame gases. Silicon tetrafluoride is commingled with these hot gases and is thus

hydrolyzed. The concentration of silicon tetrafluoride in the hydrolysis mixture is established at a selected value which corresponds in direct proportion to the surface area desired of the silica product, i.e., the surface area of the silica is increased by raising the concentration of silicon tetrafluoride in the hydrolysis mixture, and vice versa.

3,660,026

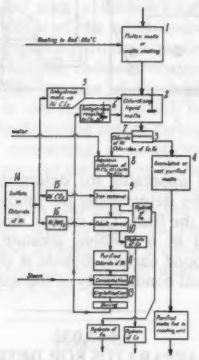
METHOD OF REMOVING IRON AND COBALT FROM A PARTIALLY REFINED NICKEL MATTE

Francis Michel, Meudon Bellevue; Louis Gandon; Roger Jean, both of Le Havre, and Pierre Fer, Le Havre-Caucriauville, all of France, assignors to LeNickel, Paris, France

Filed May 9, 1969, Ser. No. 823,385

Int. Cl. C01g *51/04*; C22b *9/12*; C01g *53/04*; C22b *23/00*

U.S. Cl. 23—183 **9 Claims**



A partially refined fused nickel matte is energetically and thoroughly washed with a chloridizing substance such as nickel chloride. The use of a chloridizing substance, which is preferred to an oxidizing agent as in the case of the usual treatment in a Bessemer converter, leads to a considerably improved selectivity in the refining of nickel mattes.

3,660,027

HIGH PURITY HOT PRESSED BORON NITRIDE

Victor Mandorf, Jr., Olmsted Falls, and Lionel C. Montgomery, North Olmsted, both of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed May 6, 1969, Ser. No. 822,214

Int. Cl. C01b *21/06*

U.S. Cl. 23—191 **12 Claims**

High purity boron nitride articles of manufacture having a high density and improved properties. The improved boron nitride articles have a unique acicular crystal structure, an oxygen content of less than 0.5 percent by weight, a density of at least 1.9 grams/cc., excellent hot strength, low and substantially isotropic coefficients of thermal expansion with no irreversible thermal expansion, excellent thermal shock resistance, moisture insensitivity and improved dielectric properties. These articles are produced by treating conventional hot pressed boron nitride articles with a suitable solvent to lower their boron oxide (B_2O_3) content, and then sintering the treated material in an inert atmosphere at a temperature of from 1,600° C. to 2,100° C. in the absence of pressure or mechanical restraint.

3,660,028

AMMONIA SYNTHESIS CATALYST

Kenzi Tamaru; Takaharu Onishi, both of Kanagawa; Mitsuyuki Soma, and Mizuo Sudo, both of Tokyo, all of Japan, assignors to Tokyo University, Tokyo, Japan

Filed Feb. 6, 1970, Ser. No. 9,426

Claims priority, application Japan, Feb. 6, 1969, 44/8940

Int. Cl. C01c *1/04*

U.S. Cl. 23—198 **10 Claims**

The present invention provides a novel catalyst and improved process for direct synthesis of ammonia from nitrogen and hydrogen which comprises employing a complex of alkali metal or organo-alkali metal with graphite, said organo-alkali metal being an alkali metal benzophenone ketyl or an alkali metal salt of an aromatic hydrocarbon.

3,660,029

PROCESS FOR BENEFICIATING ILMENITE

Ahmed G. E. Naguib, Jacksonville, Fla., assignor to Edith W. Carpenter, Jacksonville, Fla.

Continuation-in-part of application Ser. No. 62,612, Aug. 10, 1970. This application Apr. 9, 1971, Ser. No. 132,899

Int. Cl. C01g *23/04*

U.S. Cl. 23—202 R **20 Claims**

A process for treating ilmenite to obtain a beneficiated product having a relatively high titanium dioxide content. Particulate ilmenite is first heated in the presence of a reducing agent to reduce the iron compounds in the ilmenite to ferrous oxide and/or metallic iron. The resulting product is then leached with a dilute inorganic acid to solubilize the reduced iron values. The liquor produced during leaching is then filtered from the unsolubilized residue, and the latter is subjected to a combination of process steps. Such steps include magnetic separation to remove essentially all of the iron valves remaining in the residue, and electrical separation to remove essentially all of the silicon values therein. Also, the residue is roasted at a relatively high temperature to drive off the water of crystallization which associates therewith during leaching. The final product contains up to 98 percent titanium dioxide by weight.

3,660,030

METHOD OF PREPARING NITROSYL CHLORIDE

Neville Colebourne, and Philip Richard Edwards, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Apr. 6, 1970, Ser. No. 26,156

Claims priority, application Great Britain, Apr. 21, 1969, 20,286/69

Int. Cl. C01b *21/52*

U.S. Cl. 23—203 N **9 Claims**

A process for the preparation of nitrosyl chloride which comprises reacting together hydrogen chloride and nitrogen dioxide in the presence of nitric acid.

3,660,031

METHOD FOR PREPARING BORON SUBOXIDE

Cressie E. Holcombe, Jr., and Ottis J. Horne, Jr., both of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Mar. 9, 1971, Ser. No. 122,506

Int. Cl. C01b *35/00*

U.S. Cl. 23—204 R **3 Claims**

Boron suboxide (B_7O) is prepared by the reduction of zinc oxide with boron in an inert atmosphere at a temperature of 1,200°–1,500 C.

3,660,032

PROCESS FOR REGENERATION OF SULFURIC ACID LADEN ACTIVATED CARBON

Samuel L. Torrence, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 18,353, Mar. 10, 1970, now abandoned. This application July 10, 1970, Ser. No. 53,979

Int. Cl. C01b *17/04;* B01d *15/06*

U.S. Cl. 23—225 5 Claims

A process for regenerating a sulfuric acid laden activated carbonaceous adsorbent by contacting the activated carbonaceous adsorbent at a temperature below about 350° F. with hydrogen sulfide in an amount of at least 3:1 mole ratio of hydrogen sulfide to adsorbed sulfuric acid to reduce the adsorbed sulfuric acid to elemental sulfur which remains adsorbed on the adsorbent, steam stripping at least 1 mole of elemental sulfur per 3 moles of hydrogen sulfide from the activated carbonaceous adsorbent and recovering the steam stripped elemental sulfur. When it is desired to strip less than all of the elemental sulfur from the activated carbonaceous adsorbent the remaining sulfur may be reduced with hydrogen to produce hydrogen sulfide for use in reducing the adsorbed sulfuric acid.

3,660,033

DISPOSABLE SPECIMEN COLLECTION AND ANALYSIS BAG

Leroy L. Schwartz, 3486 Richmond Avenue, Eltingville, Staten Island, N.Y.

Filed Sept. 29, 1969, Ser. No. 861,728

Int. Cl. G01m *1/18, 21/24;* B65d *75/12*

U.S. Cl. 23—230 R 13 Claims

A flexible sealed bag for containing and analyzing a specimen, comprising: an entrance; a first reservoir, communicating with the entrance, which receives specimen through the entrance; manually actuatable sealing means between the entrance and the reservoir; with a solid specimen, a liquid solvent in the reservoir into which the specimen becomes mixed; a narrow channel connecting the reservoir with an analysis chamber for permitting liquid in the reservoir to pass into the analysis chamber; the channel from reservoir to analysis chamber including manually actuatable sealing means for closing off the channel after adequate liquid has passed from the reservoir into the analysis chamber; the analysis chamber already holding a substance for reacting with the liquid transferred thereto; whereby a liquid specimen is divided into two parts, the part in the reservoir and the part in the analysis chamber.

3,660,034

INSTRUMENTAL METHOD AND EQUIPMENT FOR THE DETERMINATION OF THE DEGREE OF MATURITY IN FRUIT, PARTICULARLY IN POMACEOUS FRUIT

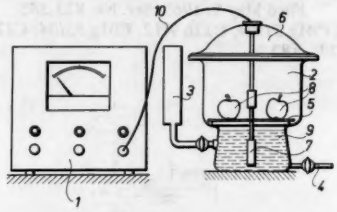
Jozsef Baranyi, Mezotur, and Luszlo Lakatos, Torokszentmiklos, both of Hungary, assignors to Licencia Talalmanyokat Ertekesito Vallalat, Budapest, Hungary

Filed Dec. 2, 1969, Ser. No. 881,441

Claims priority, application Hungary, Dec. 2, 1968, BA2137

Int. Cl. G01m *27/00;* G01n *31/06, 33/02*

U.S. Cl. 23—230 R 7 Claims



A process and apparatus for determining the degree of maturity in fruit by determining the amount of carbon dioxide developed by the fruit. The carbon dioxide formed by the fruit is absorbed in a suitable alkaline solution and the amount of developed carbon dioxide is determined by measuring the electrical conductivity of the solution.

3,660,035

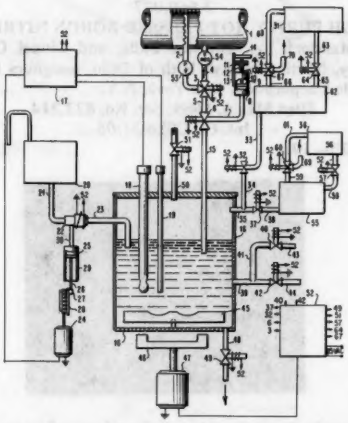
METHOD AND APPARATUS FOR DETERMINATION OF HYDROGEN SULFIDE IN HYDROGEN SULFIDE PETROLEUM PRODUCTS

Robin S. Marsh, Box 1363 c/o Aramco, Dhahran, Saudi Arabia

Filed Mar. 26, 1969, Ser. No. 810,604

Int. Cl. B01k *3/00;* G01n *31/16*

U.S. Cl. 23—230 R 11 Claims

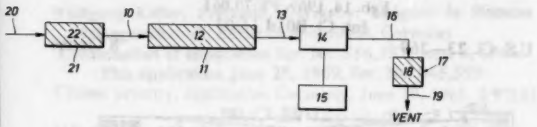


A method for the rapid and accurate determination of the hydrogen sulfide content of a liquid petroleum hydrocarbon. The hydrogen sulfide in a known quantity of said hydrocarbon is dispersed into an ionic state and titrated with a standard cadmium salt solution to determine the hydrogen sulfide content of the hydrocarbon. A hydrogen sulfide analyzer for carrying out the method is also disclosed.

3,660,036
ANALYTICAL METHOD AND APPARATUS

Royal H. Benson, Texas City, Tex., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 22, 1969, Ser. No. 886,953
Int. Cl. G01n *23/12*; G21h *5/00*
U.S. Cl. 23—230 R 19 Claims



An improvement in a method for analyzing labile-hydrogen-containing compounds present in mixtures wherein the mixture is passed over a labile-tritium-containing substrate to effect exchange of the labile hydrogen with the labile tritium and the resulting tritium-containing compound is detected and measured, the radioactivity measurement being used to determine the amount of the labile-hydrogen-containing compound in the mixture, which comprises passing the effluent from the detecting means through a high capacity "tritium trap" containing a substance having labile-hydrogen atoms to prevent the venting of dangerous amounts of radioactive tritium-containing compounds into the atmosphere. The invention also provides the combination of a suitable "tritium trap" with an analytical system for carrying out the above method comprised of a column connected to the outlet of the detecting means and which contains a substance having labile-hydrogen atoms.

3,660,037
DEVICE FOR MEASURING BLOOD SEDIMENTATION RATE

Kurt Rudolf Sokol, Schwachhauser Heerstr. 295, 28 Bremen, Germany

Filed Aug. 10, 1970, Ser. No. 62,256
Int. Cl. B01l *3/00*; G01n *15/04*, *33/16*
U.S. Cl. 23—253 R 8 Claims

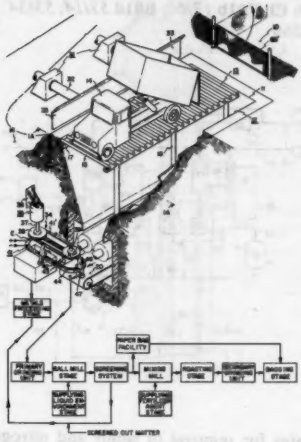
A unitary device comprising a cannula and a syringe barrel of rather large diameter for withdrawing blood, combined with one or more telescoping cylinders of relatively smaller diameter in which the sedimentation rate is measured.

3,660,038
INTEGRATED GARBAGE PROCESSING SYSTEM

John C. Brewer, Salt Lake City, Utah, assignor to Garbalizer Corporation of America, Salt Lake City, Utah

Original application Feb. 5, 1968, Ser. No. 707,910, now abandoned. Divided and this application Aug. 7, 1970, Ser. No. 61,992
Int. Cl. B65g *67/24*
U.S. Cl. 23—259.1 4 Claims

The present invention provides a system and method for processing municipal refuse or garbage into useable fertilizer products. Suitable means are preferably incorporated for separating metals from the refuse and for processing the same into commercially deliverable metal products such as ingots. In a preferred form of the invention the system or

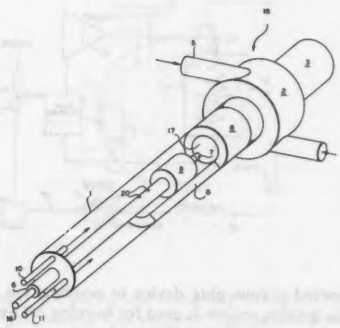


method is used in conjunction with a municipal sewage treatment plant wherein the liquid and sludge phases thereof are utilized in the system and method for milling and also for enriching the slurry developed in the system and method, for ultimate processing as a useable fertilizer product.

3,660,039
CARBON BLACK REACTOR WITH POSITIONABLE CHOKE

Eulas W. Henderson, Toledo, Ohio, assignor to Phillips Petroleum Company

Continuation-in-part of application Ser. No. 769,283, Oct. 21, 1968, now abandoned. This application Sept. 11, 1970, Ser. No. 71,471
Int. Cl. C09c *1/48*; F23d *15/00*
U.S. Cl. 23—259.5 5 Claims



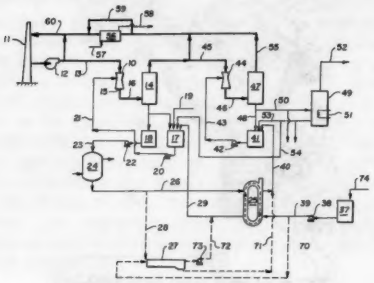
Apparatus for producing carbon black in which a plug choke is variably positionable along the length of the first reaction section to vary its length or, at the extreme position of the choke, to eliminate the first section.

3,660,040

GASEOUS OXIDE RECOVERY

Charles I. Harding; Lamar V. Russell; W. Malcolm Steeves, all of P.O. Box 4850, Jacksonville, Fla., and Irwin R. Higgins, P.O. Box 549, Oak Ridge, Tenn.

Filed Apr. 10, 1969, Ser. No. 814,936
Int. Cl. C01b *17/60;* **B01d** *53/14, 53/34*
U.S. Cl. 23—260 **11 Claims**



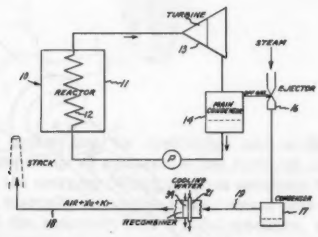
An apparatus for removal of sulfur and nitrogen dioxide from gases which may comprise a plurality of scrubbers and an ion exchange resin bed successively receiving gas containing SO_2 and nitrogen oxides and contacting the same with absorbing liquor and the resin bed, means receiving the absorbing liquor from at least one of said scrubbers for removing and concentrating SO_2 from at least a portion of said absorbing liquor, and means for concentrating SO_2 and nitrogen oxides directly in said resin bed, desorbing means receiving the concentrated SO_2 and nitrogen oxides and placing it in gaseous condition and recovery means for gaseous SO_2 connected to said desorbing means and receiving gaseous SO_2 therefrom, recovering nitrogen oxides in soluble nitrate form.

3,660,041

BURNER-FLAME ARRESTER FOR BURNING OFF-GAS FROM A BOILING WATER REACTOR POWER PLANT

George E. Moore, Scotia, and Lee H. Tomlinson, Schenectady, both of N.Y., assignors to General Electric Company

Filed Oct. 29, 1968, Ser. No. 771,467
Int. Cl. B01j *1/14;* **F23d** *13/16;* **G21f** *9/02*
U.S. Cl. 23—262 **5 Claims**



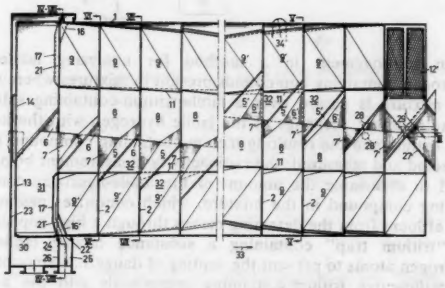
A cooled porous plug device in combination with a continuous ignition source is used for burning off explosive mixtures of contaminated radiolytic hydrogen-oxygen gas flow discharged from the steam turbine cycle of a boiling water nuclear power reactor. Optional use of a second cooled porous plug is shown, the second porous plug being located downstream of the burner to function as a heat exchanger to cool the combustion products for controlled condensation of the water vapor.

3,660,042

APPARATUS FOR EXTRACTING WITH A LIQUID, PRODUCTS WHICH ARE PART OF SOLIDS

Georges Francois Duchateau, Tienen, and Ferdinand Joseph Vanherwegen, Oplinter, both of Belgium, assignors to Raffinerie Tirlemontoise, Brussels, Belgium

Filed Feb. 20, 1969, Ser. No. 801,018
Claims priority, application Belgium, Feb. 23, 1968, 711,219; Feb. 14, 1969, PV 70,061
Int. Cl. B01d *11/02*
U.S. Cl. 23—269 **8 Claims**



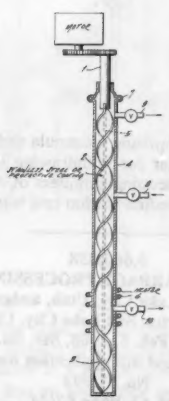
This invention relates to an apparatus for extracting with a liquid, products which are part of solids, by advancing in countercurrent liquid and solids through a drum which comprises at least one screw conveyor with an upstream end and a downstream end, part at least of the conveyor turns defining compartments which are provided with elements for raising the solids and for separating the solids from the liquid, the solids falling from the raising elements back into the drum bottom each time in a different liquid fraction.

3,660,043

METHOD AND DEVICE FOR FEEDING CRYSTALS AND MELTS

Herman Schildknecht, Wilcken Str. 5, and Klaus Maas, Quinke Str. 44, both of Heidelberg, Germany

Filed Jan. 31, 1969, Ser. No. 796,321
Claims priority, application Germany, Jan. 31, 1968, P 17 19 468.2
Int. Cl. B01d *9/04*
U.S. Cl. 23—273 F **2 Claims**



Apparatus for feeding crystals and melts in a crystallization column comprising a rigid strip freely rotatably mounted in the column, the edges of said strip bearing against the inside

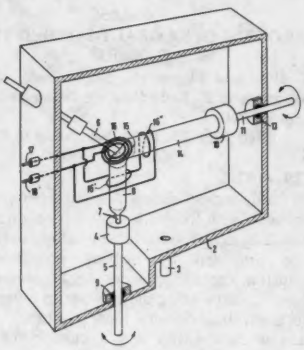
of the column and the strip being twisted spirally in one direction about its longitudinal axis, at least one end of the strip being connected to a driving means adapted to rotate the strip about its longitudinal axis.

3,660,044

APPARATUS FOR CRUCIBLE-FREE ZONE MELTING OF CRYSTALLINE RODS

Wolfgang Keller, Pretzfeld, Germany, assignor to Siemens Aktiengesellschaft, Berlin-Siemensstadt, Germany

Continuation of application Ser. No. 556,157, June 8, 1966. This application June 25, 1969, Ser. No. 845,599
Claims priority, application Germany, June 10, 1965, S 97543
Int. Cl. B01j *17/10*
U.S. Cl. 23—273 SP **11 Claims**



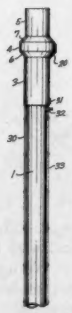
Apparatus for crucible-free zone melting a rod of crystalline material includes a melting chamber, axially displaceable and rotatable holders for supporting a stock rod to be recrystallized and a recrystallized rod mounted in the melting chamber, the holders having axes extending inclined or transversely to one another, and means for heating the stock rod so as to form a melting zone therein connecting the stock rod with the recrystallized rod.

3,660,045

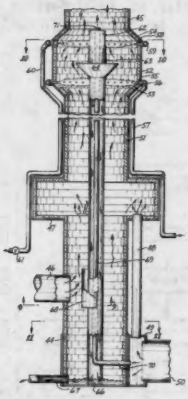
SMOKE CLARIFIER

Norman D. Gladu, Langley, British Columbia, Canada, assignor to Intercontinental Environmental Controls Ltd., Vancouver, British Columbia, Canada

Filed Feb. 20, 1970, Ser. No. 13,004
Int. Cl. F23g *7/06*; B01d *47/06*
U.S. Cl. 23—277 C **11 Claims**



Water sprays projected in the form of a curtain through smoke rising through a smokestack transversely of the direction of smoke movement entrain particulate material in the smoke and carry it away. The sprays may cooperate with a baffle which aids precipitation of particles and creates turbulence to facilitate such separation further. Additionally, combustible impurities may be burned by flame jets preceding the spray washing operation, and supplemental air may be mixed with the smoke preceding the flame zone.

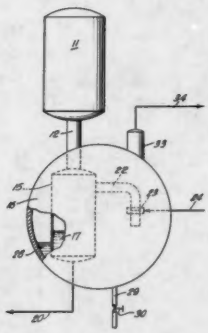


3,660,046

QUENCHING APPARATUS FOR A HIGH PRESSURE SYNTHESIS GAS PROCESS

Randlow Smith, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Feb. 5, 1970, Ser. No. 8,791
Int. Cl. B01d *47/02*
U.S. Cl. 23—284 **8 Claims**



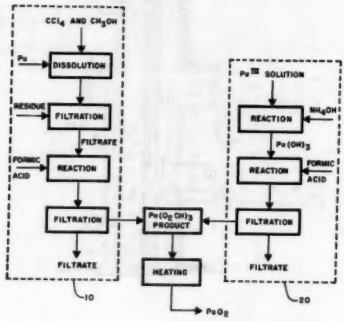
A combined quenching and scrubbing structure for use in a synthesis gas process that employs high pressure and temperature. There is a thin walled quenching vessel that is constructed of high alloy steel to withstand the corrosive effects. It is contained inside of a low alloy steel spherical container that is thick walled to withstand the high pressure. An outlet from the quenching vessel has an orifice scrubber therein and both are located inside the spherical container.

3,660,047

PRODUCTION OF PLUTONIUM FORMATE AND PLUTONIUM DIOXIDE

Larry R. Crisler, Arvada, Colo., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Mar. 18, 1970, Ser. No. 20,779
Int. Cl. C01g 56/00
U.S. Cl. 23—344 2 Claims



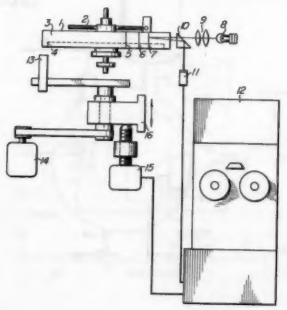
Production of plutonium dioxide by forming the novel compound plutonium formate and heating the plutonium formate, at temperature from about 250° C. to about 350° C., is described.

3,660,048

PRELIMINARY FREQUENCY REGULATING METHOD FOR REGULATORS OF WATCH MECHANISMS

Mitsuo Oh-Oka, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Apr. 21, 1970, Ser. No. 30,539
Claims priority, application Japan, Sept. 5, 1969, 44/70440
Int. Cl. B23p 13/00
U.S. Cl. 29—178 3 Claims



A flange is provided on the rim of a balance so that the preliminary frequency regulation may be attained by cutting said flange, with a balance spring mounted on the balance. At least three markings are provided on the peripheral surface of the rim so that a true frequency may be detected without being influenced by an amplitude change.

3,660,049

DISPERSION STRENGTHENED ELECTRICAL HEATING ALLOYS BY POWDER METALLURGY

John Stanwood Benjamin, Suffern, N.Y., assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Aug. 27, 1969, Ser. No. 853,327
Int. Cl. B22f 1/00
U.S. Cl. 29—182.5 6 Claims

This invention relates to the powder metallurgy of wrought, dispersion strengthened, electrical heating elements characterized metallographically by a uniform distribution of dispersoids in both the longitudinal and transverse directions, and also to a powder metallurgy method for producing the same.

3,660,050

HETEROGENEOUS COBALT-BONDED TUNGSTEN CARBIDE

Ralph K. Iler, and Eugene G. Rigby, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed June 23, 1969, Ser. No. 835,817
Int. Cl. C22c 29/00
U.S. Cl. 29—182.8 8 Claims

Strong, hard, impact-resistant bodies comprising tungsten carbide bonded with from 3 to 25% by weight of heterogeneous cobalt-tungsten solid-solution alloy, useful as cutting tools, are prepared by heating an intimately mixed cobalt/tungsten carbide powder to a temperature above 1000° C and consolidating the powder to a density of at least 98% of its theoretical density, having either.

1. mixed a carbon-rich and a carbon-deficient powder together prior to consolidation to produce a non-homogeneous binder;

2. added free carbon to a carbon-deficient powder to produce local areas where tungsten is removed from the binder alloy as tungsten carbide; or

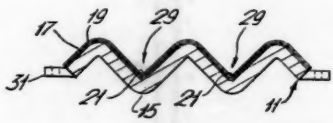
3. allowed a portion of the carbon in the tungsten carbide to oxidize during consolidation to produce areas in the binder phase which are then carbon deficient and high in tungsten.

3,660,051

CONTACT BODY

Harold William Lee, Poynton, England, assignor to Ernest Scragg & Sons Limited, Macclesfield, Cheshire, England

Continuation of application Ser. No. 625,910, Mar. 22, 1967, now abandoned. This application Dec. 11, 1969, Ser. No. 884,387
Claims priority, application Great Britain, Mar. 22, 1966, 44,805/66
Int. Cl. D02j 13/00
U.S. Cl. 29—191.6 6 Claims

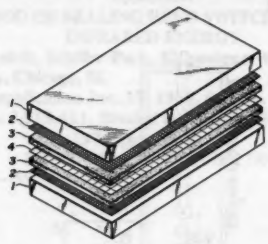


A contact body for contacting traveling materials treated with lubricating substance, such body comprising a thermally conductive base member having a surface adjacent to the path of travel of the materials and consisting of a first material subject to attack by the lubricating substance, and a coating applied to the surface and consisting at least in part of a second material which is impermeable to the lubricating substance and which is not subject to attack by the same.

3,660,052
COMPOUND BODIES OF ALUMINIUM PLATED STEEL STOCKS

Hideaki Takamatsu, Kodaira-shi; Akira Miyata, Kawasaki-shi, and Yutaka Toyabe, Tokyo, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, by said Akira Miyata

Filed June 3, 1969, Ser. No. 829,917
Int. Cl. B32p *3/20;* B32b *5/02, 15/06*
U.S. Cl. 29—195 6 Claims



Steel stocks in the form of the wire, plate, rod, tube, etc., having thin aluminium plated films are bonded to rubber or synthetic resin having durable bonding and good mechanical properties. Aluminium films prevent diffusion of deleterious elements in rubber into steel.

3,660,053
PLATINUM-CONTAINING X-RAY TARGET

Rudolf Palme, Reutte, Tirol, Austria, assignor to Schwarzkopf Development Corporation, New York, N.Y.

Filed Nov. 18, 1969, Ser. No. 877,874
Claims priority, application Austria, Dec. 2, 1968, A 11682/68
Int. Cl. B32b *15/04;* H01j *35/08*
U.S. Cl. 29—195 9 Claims

This invention relates to alloys useful in X-ray targets comprising tungsten and platinum.

3,660,054
COAL UPGRADING

Robert W. Rieve, Springfield, Pa., assignor to Atlantic Richfield Company, New York, N.Y.

Filed Sept. 29, 1970, Ser. No. 76,601
Int. Cl. C10l *9/00*
U.S. Cl. 44—1 R 4 Claims

A method for upgrading coal to a higher quality fuel or feed stock by mixing coal with water and heating the mixture in a non-oxidizing atmosphere at a temperature near the critical temperature of water and under a pressure sufficient to maintain substantially all of the water in the liquid state. By this process at least the sulfur and/or ash content of the coal is reduced.

3,660,055
SCENTED FIREPLACE FUEL

James Gilbert Haller, 50 S. Prince St., Lancaster, Pa.

Continuation-in-part of application Ser. No. 810,121, Mar. 25, 1969, now abandoned. This application June 18, 1970, Ser. No. 47,628
Int. Cl. C10l *9/00*
U.S. Cl. 44—6 2 Claims

This invention relates to scented wooden fireplace fuel comprising logs of predetermined length upon which a durable coating is applied in which an essential oil is encapulated which has a pleasant scent. The coating may be a lacquer or similar organic vehicle which is capable of minimizing dissipation of the scent of said essential oil while being stored or while the log is being burned. If desired, the logs may also be impregnated with certain pyrotechnic chemicals to impart attractive visual colors to the flames of the burning logs, as well as also being treated with a fungicide and insecticide solution to neutralize the logs from vermin while being stored.

3,660,056
FUEL COMPOSITION

Erwin A. Dorsch, Fox River Grove, Ill., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Feb. 17, 1969, Ser. No. 802,739
Int. Cl. C10l *1/18, 1/30*
U.S. Cl. 44—58 12 Claims

A gasoline composition containing, as an anti-wear additive, an aliphatic diether of diethylene glycol, or a combination of the glycol and a dialkyl ester of phthalic acid.

3,660,057
INCREASING LOW TEMPERATURE FLOWABILITY OF MIDDLE DISTILLATE FUEL

Stephan Ilnyckyj, Islington, Ontario, Canada, assignor to Esso Research and Engineering Company

Filed Mar. 17, 1969, Ser. No. 807,952
Int. Cl. C10l *1/18*
U.S. Cl. 44—62 4 Claims

The low temperature flowability of a middle distillate petroleum fuel oil, boiling within the range of about 250° to about 700° F. at atmospheric pressure is improved by adding to the fuel oil from about 0.001 to about 1.0 wt. % of a flow improving additive such as a copolymer of ethylene with another ethylenically unsaturated monomer such as an unsaturated ester or an alpha olefin, along with from about 0.01 to about 0.099 wt. % of an essentially saturated hydrocarbon fraction which is substantially free of normal paraffinic hydrocarbons and which has a number average molecular weight in the range of about 600 to about 3000.

3,660,058
INCREASING LOW TEMPERATURE FLOWABILITY OF MIDDLE DISTILLATE FUEL

Nicholas Feldman, Woodbridge, and Wladimir Philippoff, Cranford, both of N.J., assignors to Esso Research and Engineering Company

Filed Mar. 17, 1969, Ser. No. 807,953
Int. Cl. C10l *1/04*
U.S. Cl. 44—80 6 Claims

The low temperature flowability of a middle distillate petroleum fuel oil, boiling in the range of about 250° to about 700° F. is improved and its pour point is lowered by adding to the fuel oil from about 0.01 to about 3 wt. % of an essentially saturated hydrocarbon fraction which is substantially free of normal-paraffinic hydrocarbons, and which has a number average molecular weight in the range of about 600 to about 3,000.

3,660,059
FUEL GAS COMPOSITION

Robert A. Hollemann; Robert F. Huston, and Cyril A. Barrios, all of Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 13, 1970, Ser. No. 28,078
Int. Cl. B01j *1/16;* C10c *3/06*
U.S. Cl. 48—197 FM 10 Claims

Disclosed is a composition of matter useful as a fuel gas. The composition comprises a first component selected from methylacetylene, propadiene and mixtures thereof in admixture with dimethyl ether as a second component. The dimethyl ether preferably comprises at least about 25 mole percent of the composition. The composition is safely storable under pressure due to the stability against spontaneous decomposition of the unsaturated hydrocarbons afforded by the dimethyl ether. Additionally, the composition maintains an essentially constant composition upon withdrawal from storage.

3,660,060

PROCESS OF MAKING GLASS LASERS OF INCREASED HEAT DISSIPATION CAPABILITY

Louis Spanoudis, Toledo, Ohio, assignor to Owens-Illinois, Inc.

No Drawing. Filed Dec. 11, 1969, Ser. No. 884,359
Int. Cl. C03c *21/00*
U.S. Cl. 65—30 11 Claims

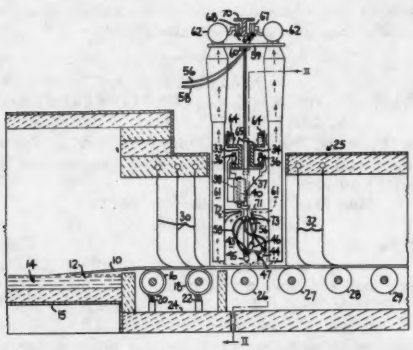
Glass lasers containing at least 1 mole percent of lithium oxide based on the total glass composition expressed in oxide content and 0 0 compound are treated by immersing or otherwise contacting the glass laser in a molten bath containing a mixture of sodium and lithium salts at an elevated temperature, preferably below the strain point of the glass laser. Optionally, the ion exchange immersion in the molten bath may be followed by washing with acid such as hydrofluoric to produce an acid polish. Glass laser rods so treated develop a compressive stress surface layer and exhibit high modulus of rupture.

3,660,061

COATED GLASS SHEET AND METHOD FOR MAKING THE SAME

Harold E. Donley, Monroeville; Raymond G. Rieser, New Kensington, and William E. Wagner, Verona, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 684,131, Nov. 20, 1967, now abandoned. This application Mar. 5, 1970, Ser. No. 16,670
Int. Cl. C03c *15/00*; C03b *18/00*
U.S. Cl. 65—32 9 Claims



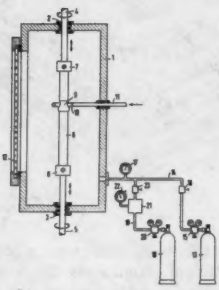
Applying a solution of a metal oxide film forming composition in an oxidizing atmosphere to a surface of a newly formed glass sheet to which oxidizing atmosphere and sheet has been exposed for at least approximately 3 seconds after removing the sheet from a reducing atmosphere containing molten tin and its vapor while the glass surface is at a temperature sufficiently high to pyrolize said composition to form a metal oxide coating thereon of sufficient thickness to provide the coated glass with desired properties, such as reducing the transmission of certain wave lengths of light in one or more desired wavelength bands through the coated sheet or making the coated sheet electroconductive. Care is taken to insure that the carrier for said composition does not evaporate completely en route to the glass surface to avoid a mottled appearance. A particularly desirable operation is to produce a continuous ribbon of a substantially homogeneous float glass composition and periodically apply a metal oxide film forming composition to provide the glass with an appearance and color similar to those of glass compositions containing coloring ingredients homogenously dispersed throughout the glass.

3,660,062

METHOD FOR CRUCIBLE-FREE FLOATING ZONE MELTING A CRYSTALLINE ROD, ESPECIALLY OF SEMI-CRYSTALLINE MATERIAL

Wolfgang Keller, Pretzfeld, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed Feb. 26, 1969, Ser. No. 802,467
Claims priority, application Switzerland, Feb. 29, 1968, 2585/68; May 30, 1968, 8043/68
Int. Cl. H01j *17/08*
U.S. Cl. 65—32 10 Claims



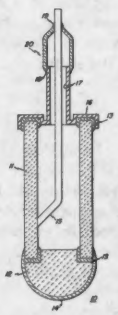
In method of floating zone melting a crystalline rod, especially of semiconductor material, disposed in a sealed receptacle wherein an induction heating coil surrounds the rod and forms a molten zone therein, the rod and heating coil being relatively movable so as to pass the molten zone through the rod, the improvement is provided which comprises passing hydrogen gas of at least 99.9 percent purity into the receptacle so as to form a protective atmosphere therein, and adjusting the pressure of the atmosphere in the receptacle to a value below atmospheric pressure; and device for carrying out the foregoing method.

3,660,063

METHOD OF FORMING SEALED CONTAINER FOR ELEMENTAL SODIUM

Harold A. Christopher, Scotia, N.Y., assignor to General Electric Company

Original application Mar. 27, 1969, Ser. No. 811,014, now Patent No. 3,579,382, dated May 18, 1971. Divided and this application July 15, 1970, Ser. No. 62,754
Int. Cl. H01m *21/14*; C03b *23/20*
U.S. Cl. 65—36 2 Claims



An evacuated, sealed container for pure elemental sodium is disclosed which has an open-ended casing of an ionic conducting material sealed at one end with a high temperature ceramic plug by means of a high melting point sodium re-

sistant glass, an electronic conductor in contact with the interior surface of the ionic conducting material and extending outwardly from the casing, and a seal at the other end of the casing. Such a container provides a suitable device for storing and dispensing pure elemental sodium, or provides a sodium electrode with an associated ionic conducting electrolyte. Methods are also described for forming evacuated, sealed containers for pure elemental sodium.

3,660,064

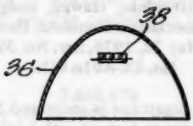
METHOD OF SEALING REED SWITCHES USING INFRARED ENERGY

Terry L. Rohde, Schiller Park, Ill., assignor to C. P. Clare & Company, Chicago, Ill.

Original application Jan. 17, 1968, Ser. No. 698,471, now Patent No. 3,518,411. Divided and this application Jan. 29, 1970, Ser. No. 6,778

Int. Cl. C03c *29/00*; C01c *27/02*

U.S. Cl. 65—59 **3 Claims**



A method of sealing a magnetic reed in the open end of a tube of infrared absorbing glass uses an elliptical reflector with an infrared energy source at one focal point. The open end of the tube is disposed at the second focal point of the elliptical reflector with the axis of the tube extending along an extension of the line connecting the two focal points. The end of the tube to be sealed is also received within a conical reflector with the tube axis aligned with the axis of the cone of reflection. The conical reflector is moved along the axis of the tube as the glass softens to form the seal so as to concentrate the infrared energy on the top of the seal.

3,660,065

METHOD OF MANUFACTURING EXTRUDATES

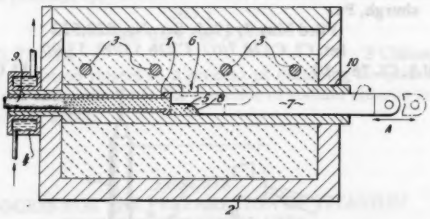
Frederick James Edwards, Northumberland, England, assignor to Thermal Syndicate Limited, Wallsend, Northumberland, England

Filed Aug. 11, 1970, Ser. No. 62,949

Claims priority, application Great Britain, Aug. 12, 1969, 40,178/69

Int. Cl. C03b *9/00*, *17/00*

U.S. Cl. 65—66 **4 Claims**



This invention relates to a method of and apparatus for manufacturing an extrudate of high temperature thermoplastic material (e.g. vitreous silica). In simplest form the method comprises delivering the thermoplastic material in plastic state to an extrusion die by means of a pump, the pump output and the dimensions of the die being chosen so that the die contains and supports the thermoplastic material throughout its plastic range. Conveniently the apparatus comprises a reciprocating pump submerged in a reservoir of the thermoplastic material in plastic condition, the inlet side of the pump being arranged to take in plastic material directly from the reservoir and the pump outlet being connected directly to an extrusion die in a wall of the reservoir.

3,660,066

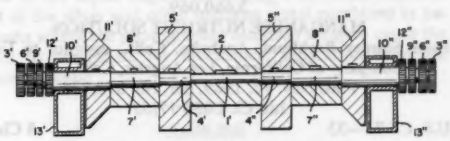
PROCESS AND APPARATUS FOR THE CONTINUOUS MANUFACTURE OF PROFILED GLASS BARS

Rudolf Pfluger, Baden, Austria, assignor to Rubo Vertriebsgeselischaft M.B.H., Wien, Austria

Filed Oct. 30, 1962, Ser. No. 872,513

Int. Cl. C03b *13/06*

U.S. Cl. 65—94 **6 Claims**



A process for rolling profiled glass bars and an apparatus for this purpose whereby a horizontal roller arrangement with at least one cylindrical roll surface and a pair of lateral roller arrangements, each with a respective roll surface contact the glass ribbon to deform the latter into the desire profile. Means is provided for driving the outer roll arrangements at 0.5 to 1.5 percent higher peripheral speeds than the central roll arrangement.

3,660,067

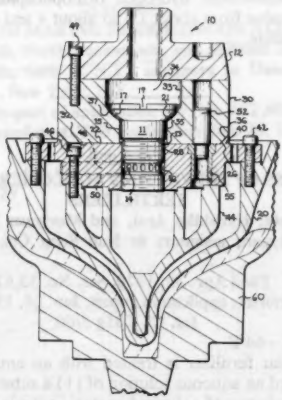
GLASS-FORMING APPARATUS

Leyshon W. Townsend, Jr., Worthington, and Warren E. Wilburn, Columbus, both of Ohio, assignors to Owens-Illinois, Inc.

Filed Jan. 26, 1970, Ser. No. 5,745

Int. Cl. C03b *11/06*

U.S. Cl. 65—302 **4 Claims**



In the operation of a plunger to form the yoke area of an article centrifugally formed in a mold, a ball and socket assembly is provided between the plunger and its associated spindle which permits the plunger to freely float from the formed glass article upon withdrawal of the plunger, thus obviating the production of crizzles and checks due to lateral pressure of the plunger on the side walls of the formed glass article.

3,660,068

SOIL ADDITIVES

Joseph F. Wilson, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Dec. 29, 1969, Ser. No. 888,868
Int. Cl. C05b 7/00; C05d 3/00
U.S. Cl. 71—34 3 Claims

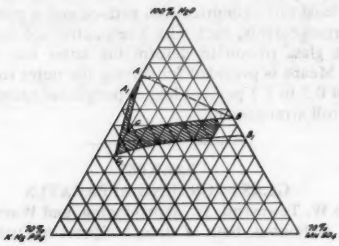
A method of preparing a granulated soil additive of calcium sulfate and a soluble salt, preferably a fertilizer, which involves granulating the calcium sulfate employing the soluble salt, incorporated with the calcium sulfate in solution form, as the granulating agent.

3,660,069

MANGANESE NUTRIENT SOLUTION

Peter Stanley Backlund, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Nov. 12, 1969, Ser. No. 875,738
Int. Cl. C05b 17/02
U.S. Cl. 71—33 8 Claims



A solution suitable for application to plants and soil to correct manganese deficiencies is described which comprises an aqueous solution of manganese sulfate and mono-potassium or mono-ammonium hydrogen orthophosphate having an acidic pH value from about 1.5 to about 4 and a novel eutectic composition.

3,660,070

PROCESS OF PREVENTING AGGLOMERATION OF FERTILIZERS

Iwao Maruta; Haruhiko Arai, and Moriyasu Murata, all of Chiba, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Apr. 30, 1970, Ser. No. 33,520
Claims priority, application Japan, Jan. 20, 1970, 45/5555
Int. Cl. C05g 3/00
U.S. Cl. 71—64 E 3 Claims

A granular fertilizer is treated with an anti-caking agent consisting of an aqueous solution of (1) a substantially water-insoluble polymer of polyvinyl acetate, polyvinyl acetals, partially saponified polyvinyl acetate, partially acetylated polyvinyl alcohol, esters of polyacrylic acid and an aliphatic alcohol, or copolymers thereof with another copolymerizable monomer, dissolved in (2) an aqueous solution of alkyl sulfates, α-olefin sulfonates or alkylsulfonates containing six to 10 carbon atoms or alkylbenzenesulfonates in which the alkyl radical contains four to eight carbon atoms. The treated fertilizer product can be packed in polyethylene bags without causing tearing or the bags during storage.

3,660,071

WATER SOLUBLE ENTRAPPING OF A PESTICIDE

Francis E. Gould, Princeton, and Thomas H. Shepherd, Hopewell, both of N.J., assignors to National Patent Development Corporation, New York, N.Y.

Original application June 13, 1969, Ser. No. 833,182, now Patent No. 3,576,760, and a continuation-in-part of 567,856, July 26, 1966, now Patent No. 3,520,949, and a continuation-in-part of 650,259, June 30, 1967, now abandoned, and a continuation-in-part of 654,044, July 5, 1967. Divided and this application Sept. 9, 1970, Ser. No. 70,940
Int. Cl. A01n 17/00; A61k 9/00
U.S. Cl. 71—65 9 Claims

Materials are entrapped in water soluble hydroxyalkyl acrylate or methacrylate polymers to provide ready sources of the material by the deletion of water. Thus, there can be entrapped drugs, pesticides, flavoring agents and fragrances.

3,660,072

RIPENING OF SUGARCANE BY USE OF CERTAIN QUATERNARY AMMONIUM HALIDES

Louis G. Nickell, Honolulu, Hawaii, assignor to Hawaiian Sugar Planters Association, Honolulu, Hawaii

Filed May 22, 1970, Ser. No. 39,925
Int. Cl. A01n 9/20
U.S. Cl. 71—121 6 Claims

Sucrose yield of sugarcane is increased by treating sugarcane a few weeks prior to harvest with a quaternary ammonium salt such as a higher alkyltrimethylammonium bromide or chloride wherein the higher alkyl group contains between about 8 and 20 carbon atoms.

3,660,073

ORE PELLETIZING AID

Roger W. Youngs, Hinsdale, and Joseph M. Sandri, Flossmor, both of Ill., assignors to Nalco Chemical Company, Chicago, Ill.

Filed May 21, 1969, Ser. No. 826,547
Int. Cl. C21b 1/22, 1/26
U.S. Cl. 75—3 8 Claims

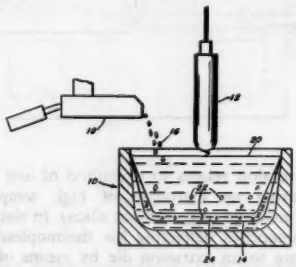
The invention relates to an organic ore pelletizing aid, to a method for making it, and to a method for pelletizing ore using the pelletizing aid. The pelletizing aid comprises coal which has been treated with an alkali metal hydroxide. A particular advantage is the provision of good ore "ballability," even at relatively high moisture content. The pelletizing aid may be coated with a high molecular weight, water dispersible organic polymer to further improve its performance.

3,660,074

METHOD FOR TREATING TITANIUM SCRAP

Russell C. Buehl, Beaver, Pa., assignor to Crucible Inc., Pittsburgh, Pa.

Filed May 7, 1969, Ser. No. 822,522
Int. Cl. C22d 7/02; C22b 53/00, 53/00
U.S. Cl. 75—10 11 Claims



This is a process for melting titanium scrap to provide a material free from dense inclusions. This is accomplished by

melting a quantity of titanium scrap in a crucible, maintaining the same molten for a period sufficient to either melt dense inclusions or have them in unmelted form sink to the bottom of the melt, discontinuing heating to form a solidified skull adjacent to the bottom of the melt to entrap the inclusions and then removing the inclusion-free metal from the crucible.

3,660,075

CRUCIBLE COATING FOR PREPARATION OF U AND P ALLOYS CONTAINING ZR OR HF

Delbert R. Harbur; John W. Anderson, both of Los Alamos, and Richard K. Money, Espanola, all of N. Mex., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Oct. 16, 1969, Ser. No. 867,096
Int. Cl. C22b *7/00*; C22d *7/06*; C22b *7/00*
U.S. Cl. 75—65 **1 Claim**

A method of limiting adverse oxygen contamination in the preparation of uranium and plutonium alloys containing zirconium or hafnium, in which the metals are melted and alloyed in a graphite crucible coated with niobium carbide or yttrium oxide.

3,660,076

TREATMENT OF MATERIAL REMOVED FROM MOLTEN ALUMINUM

Merlyn M. Williams, Montreal, Quebec, Canada, assignor to Alcan Research and Development Limited, Montreal, Quebec, Canada

Filed Sept. 17, 1970, Ser. No. 73,261
Int. Cl. C22b *7/00*, *21/00*; C01f *7/02*
U.S. Cl. 75—68 R **18 Claims**

Material such as is skimmed from the surface of molten aluminum in a casting furnace, which usually contains considerable aluminum metal along with chemical compounds such as alumina, is crushed and treated with dry steam at a moderately elevated temperature, so that unwanted carbides and nitrides are eliminated and the treated skim or the like is conditioned for recovery of useful values, advantageously by classification thereafter into a coarse fraction providing aluminum metal suitable for remelting and a fine fraction in which chemical material is reclaimed, that may include values suitable for use in the fused bath of an aluminum reduction cell.

3,660,077

PROCESS FOR DETINNING TINNED SHEET IRON

Erich Ruf, Essen, Germany, assignor to Th. Goldschmidt A.-G., Essen, Germany

Filed Feb. 16, 1970, Ser. No. 11,290
Claims priority, application Germany, Feb. 20, 1969, P 19 08 503.1
Int. Cl. C22b *25/06*
U.S. Cl. 75—98 **3 Claims**

This invention relates to a process of detinning tin-plated sheet iron with soda lye in the presence of sodium chlorite as an oxidizing agent.

3,660,078

PROCESS FOR THE PREPARATION OF TITANIUM DIOXIDE CONCENTRATES

Shigeki Yamada, Kyoto; Kokichi Miyazawa, Shiga; Hideaki Naka, Shiga, and Yoshio Yoshida, Shiga, all of Japan, assignors to Ishihara Sangyo Kaisha, Ltd., Osaka, Japan

Filed Feb. 9, 1970, Ser. No. 10,048
Claims priority, application Japan, Feb. 8, 1969, 44/9012
Int. Cl. C22b *53/00*
U.S. Cl. 75—101 **19 Claims**

A process for the production of a titanium dioxide concentrate highly enriched with titanium dioxide and having low contents of other components comprising leaching a titaniferous material with a mineral acid in the presence of a seed material capable of accelerating the hydrolysis of titanium salts.

3,660,079

PRECIOUS METALS RECOVERY METHOD

Hargovind L. Govani, West Nyack, N.Y., assignor to Midland Processing Inc., North White Plains, N.Y.

Filed Jan. 28, 1971, Ser. No. 110,593
Int. Cl. C22b *11/04*, *11/06*
U.S. Cl. 75—109 **17 Claims**

Photographic emulsion scrap is broken down into a liquid dispersion in a hot solution of an acid such as hydrochloric acid. A finely divided metal powder, such as zinc powder, is added to the liquid dispersion causing a chemical displacement of the silver and other precious metal combined in halide salts within the photographic emulsion scrap to cause the metals to precipitate for mechanical separation from the remaining liquid.

3,660,080

AUSTENITIC ALLOY AND WELD

Espy, Ronald H., Randallstown, and Elbert E. Denhard, Jr., Towson, both of Md., assignors to Armco Steel Corporation, Middletown, Ohio

Filed Jan. 31, 1969, Ser. No. 795,683
Int. Cl. C22c *39/20*
U.S. Cl. 75—128 A **9 Claims**

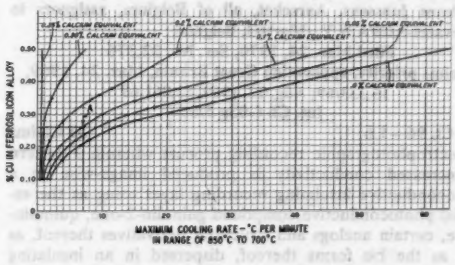
Sound, ductile austenitic alloy and weld of high strength in the as-welded condition. The alloy essentially consists of an iron-chromium-nickel-manganese austenitic matrix with a second phase comprising a columbium compound, the columbium-rich phase serving to host non-metallic impurities such as phosphides, sulphides, silicides and borides and preclude their depositing in the austenitic grain boundaries. The alloy contains about 12% to 30% chromium, about 10% to 55% nickel, about 5% to 15% manganese, up to 3% molybdenum, carbon about 0.03% to .20%, nitrogen about 0.03% to 0.30%, with 0.5% to 4.5% columbium and/or 1% to 7% tungsten, and remainder iron, this amounting to at least about 22%.

3,660,081

METHOD MAKING FERROSILICON ALLOY

John W. Farrell, North Tonawanda, and William D. Forgeng, Niagara Falls, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 652,884, July 12, 1967, now abandoned. This application Jan. 26, 1970, Ser. No. 5,766
Int. Cl. C22c *39/44*, *39/54*
U.S. Cl. 75—129 **4 Claims**



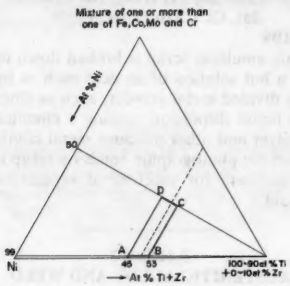
Method for producing tough non-friable, non-disintegrating ferrosilicon by the addition of copper to the ferrosilicon in the molten state and controlling the cooling rate of the resultant casting in accordance with the copper content and the calcium and aluminum contents of the casting.

3,660,082

CORROSION AND WEAR RESISTANT NICKEL ALLOY

Akira Negishi; Kiyoshi Takayanagi, and Masaru Ikeda, all of Tokyo, Japan, assignors to The Furukawa Electric Company Limited, Tokyo, Japan

Filed Dec. 27, 1968, Ser. No. 787,435
Int. Cl. C22c *15/00, 19/00*
U.S. Cl. 75—134 16 Claims



Corrosion and wear resistant nickel alloys are disclosed wherein 1–50 at. % of the Ni atoms is substituted by one or more of Fe, Mo, Co and Cr and 0–10 at. % of Ti atoms is substituted by Zr. The Ni atoms and Ti atoms are contained in an alloy consisting of 45–53 at. % of Ti and the remainder of Ni.

3,660,083

POLYARYLALKANE-TERMINATED, SOLVENT-RESISTANT POLYCARBONATE RESINS AS PHOTOCONDUCTORS

Melvin S. Bloom, and Stewart H. Merrill, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 25, 1970, Ser. No. 49,953
Int. Cl. G03g *5/02*
U.S. Cl. 96—1.5 2 Claims

Polyarylalkane-terminated polycarbonate resins are disclosed which when utilized in photoconductive layers and elements show superior stability and resistance to lixiviation by the carrier liquid of liquid xerographic developers.

3,660,084

RECORDING PROCESS USING QUINOLIN-2-ONE OR QUINOLIN-4-ONE ORGANIC PHOTOCONDUCTIVE SUBSTANCES

Johannes Joseph Vanheertum, Halle-Zandhoven; Albert Lucien Poot, Kontich; Jozef Frans Willems, Wilrijk, and Wilhelmus Janssens, Aarschot, all of Belgium, assignors to Gevaert-AGFA N.V., Mortsel, Belgium

Filed Mar. 24, 1970, Ser. No. 22,376
Claims priority, application Great Britain, Mar. 24, 1969, 15,333/69; Aug. 22, 1969, 42,061/69
Int. Cl. G03g *5/06*
U.S. Cl. 96—1.6 33 Claims

Electrophotographic recording process wherein a pattern of increased conductivity is produced image-wise in a photoconductive insulating recording layer using as the essential photoconductive compound guinolin-2-one, quinolin-4-one, certain analogs and structural derivatives thereof, as well as the bis forms thereof, dispersed in an insulating binder. At least about 10 percent by weight of the recording element is constituted by the photoconductive compound and a spectral sensitizing agent for the photoconductor can be included. This class of photoconductors is also useful in the production of phosphor patterns on cathode-ray tube screens.

3,660,085

SPECTRAL SENSITIZATION OF PHOTOCONDUCTIVE COMPOSITIONS WITH PYRROL OR INDOLIZINYL CYANINE DYES

Henri Depoorter, Mortsel; Guy Alfred Rillaers, Kontich; Karel Eugeen Verhille, Mortsel, and Theofiel Hubert Ghys, Kontich, all of Belgium, assignors to Gevaert-AGFA N.V., Mortsel, Belgium

Filed Dec. 2, 1969, Ser. No. 881,597
Claims priority, application Great Britain, Dec. 16, 1968, 59,804/68
Int. Cl. G03g *5/08*
U.S. Cl. 96—1.7 10 Claims

An inorganic recording material is described comprising a photoconductive substance, the light-sensitivity of which is increased by a monomethine, trimethine or pentamethine dye salt or betaine dye wherein the methine group or chain is terminated at each end either by 1H-pyrrol-2-yl or 1H-pyrrol-3-yl groups including such groups with fused aromatic rings or by 1- or 3-indolizinyl groups including substituted indolizinyl groups and wherein, the case of terminating pyrrole nuclei the said dyes contain in their molecule at least one carboxylic acid or sulphonic acid group in acid or salt form when both nitrogen atoms of the heterocyclic pyrrole nuclei carry substituents. The recording material has good spectral sensitizing effects in an aqueous as well as in an organic medium and has a high fastness to light.

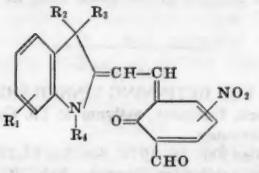
3,660,086

ELECTROPHOTOGRAPHIC PLATE AND PROCESS EMPLOYING INORGANIC PHOTOCONDUCTIVE MATERIAL WITH A PHOTOCHROMIC SENSITIZING AGENT

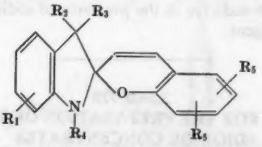
Yasuo Tamai; Chiaki Osada; Hisatake Ono, and Satoru Honjo, all of Asaka-shi, Japan, assignors to Xerox Corporation, Rochester, N.Y.

Filed Jan. 2, 1970, Ser. No. 394
Claims priority, application Japan, Jan. 17, 1969, 44/3261
Int. Cl. G03g *5/00, 7/00*
U.S. Cl. 96—1.7 14 Claims

An electrophotographic plate which comprises a photoconductive layer comprising a photoconductive material, a binder material, and a photochromic sensitizing agent selected from the group consisting of:



wherein: R_1 = H, a halogen, R or OR where R is an alkyl group having one to seven carbon atoms, R_2 and R_3 = an alkyl group having one to seven carbon atoms, and R_4 = $(CH_2)_n SO_3H$ or $(CH_2)_n COOH$, where $n = 1$ to 7;



wherein: R_1 = R, a halogen, R or OR where R is an alkyl group having one to seven carbon atoms, R_2 and R_3 = an alkyl group having one to seven carbon atoms, R_4 = $(CH_2)_n SO_3H$ or $(CH_2)_n COOH$ where $n = 1$ to 7, and R_5 and R_6 = H, NO_2, a halogen, CN, OR, or COOR where R is an alkyl group having one to seven carbon atoms, providing R_5 and R_6 do not represent H atoms simultaneously;

and mixtures thereof, is disclosed. Electrophotographic processes employing these plates are also disclosed.

3,660,087

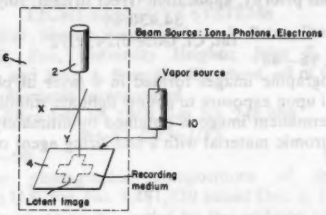
NUCLEATION IN RECORDING AND DEVELOPMENT

Alfred F. Kaspaul, and Erika E. Kaspaul, both of Malibu, Calif., assignors to Hughes Aircraft Company, Culver CIty, Calif.

Continuation-in-part of application Ser. No. 582,079, Sept. 26, 1966, now abandoned. This application July 7, 1969, Ser. No. 839,271

Int. Cl. G03g *13/22, 5/06*

U.S. Cl. 96—1.8 13 Claims



The image-recording medium comprises an actinic ray sensitive material and a metallic compound which acts as a nucleation-inducing medium dispersed in a film-forming vehicle and preferably coated on a substrate. The actinic ray sensitive material is preferably zinc oxide, while the nucleation-inducing medium is preferably a copper-containing compound.

The process is directed to forming and using the medium and comprises dispersing the sensitive material in the vehicle with the aid of a vehicle solvent and dispersing the metallic compound in the mixture with the aid of a solvent compatible with the vehicle solvent, followed by forming the mixture into a film. The medium is imagewise exposed, followed by development by imagewise disposition of metal from metal vapor, in accordance with nucleation sites produced by exposure.

3,660,088

PHOTO-RESIST PROCESS

Christian B. Lundsager, Ashton, Md., assignor to W. R. Grace & Co.

Filed Sept. 16, 1970, Ser. No. 72,776

Int. Cl. G03c *5/00;* G03f *7/00;* G03c *11/12*

U.S. Cl. 96—36 6 Claims

This invention relates to etching metal by a photo-resist process which comprises coating a metal or metal clad, e.g., copper, substrate with a photocurable composition consisting essentially of (1) a polyene containing at least 2 reactive unsaturated carbon to carbon bonds per molecule, (2) a polythiol containing at least two thiol groups per molecule, the total combined functionality of (a) the reactive unsaturated carbon to carbon bonds per molecule in the polyene and (b) the thiol groups per molecule in the polythiol being greater than 4, and (3) 0.0005 to 50 percent by weight of said composition of a photosensitizer, covering said composition with a UV transparent film adherable to the composition in its cured state, exposing said composition through said film and an image bearing transparency or mask to a free radical generator such as electromagnetic radiation having a wavelength of about 2,000–7,000 A. or high energy ionizing radiation to selectively cure and insolubilize the exposed portion of the composition and adhere same to the UV transparent film, removing the image bearing transparency and the UV transparent film with substantially all the cured portion of the composition adhering thereto, thus baring the metal beneath the removed cured portion of the composition, exposing the composition remaining on the metal or the metal clad substrate directly to a free radical generator to cure and insolubilize same, removing the exposed metal from the substrate and thereafter removing the cured composition thus leaving defined metal segments on the substrate.

3,660,089

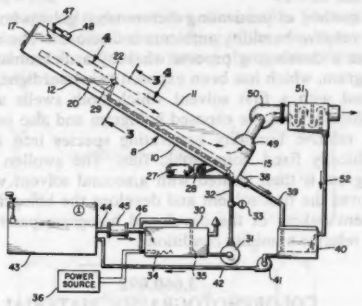
PRINTING PLATE PROCESSING METHOD

John E. Pickard, Selma, Ind., assignor to Ball Brothers Company Incorporated, Muncie, Ind.

Original application Apr. 19, 1966, Ser. No. 543,675, now Patent No. 3,528,358, dated Sept. 15, 1970. Divided and this application Dec. 24, 1969, Ser. No. 889,827

Int. Cl. G03c *5/24*

U.S. Cl. 96—48 R 14 Claims



Method for developing and desensitizing lithographic plates having latent images in the form of a polymer coating of varying solubilities in differing areas by dispersing a solvent or desensitizer onto the plate, drying the plate, removing dissolved impurities from the solvent in situ, preferably by distilling the solvent, and returning the purified solvent to a reservoir for re-use.

3,660,090

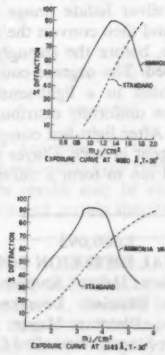
TECHNIQUE FOR INCREASING THE SPEED OF DICHROMATED GELATIN

Robert Kryan Curran, Stirling, and Lillian Ann Rankel, North Plainfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 30, 1970, Ser. No. 23,575

Int. Cl. G03c *5/22, 5/04*

U.S. Cl. 96—49 6 Claims



A technique for increasing the photographic speed of dichromated gelatin destined for use in holographic system involves subjecting the gelatin to an ammonia-water vapor ambient subsequent to exposure and prior to development.

3,660,091

PASSIVATION OF DICHROMATED GELATIN HOLOGRAMS TO HIGH RELATIVE HUMIDITY AMBIENTS

Theodore Arthur Shankoff, Mendham, and Constance Veronica Stanionis, Piscataway, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 13, 1970, Ser. No. 28,136
Int. Cl. G03c 5/22, 5/04
U.S. Cl. 96—49 3 Claims

A method of passivating dichromated gelatin holograms to high relative humidity ambients is disclosed. The method involves a developing process whereby a dichromated gelatin hologram, which has been exposed to a laser light, is initially treated with a first solvent which both swells and photographically fixes the exposed hologram and also introduces a high relative humidity passivating species into the photographically fixed holographic film. The swollen and fixed hologram is then treated with a second solvent which both removes the first solvent and develops the hologram. A subsequent baking of the developed hologram passivates it to high relative humidity conditions.

3,660,092

COLORPHOTOGRAPHIC MATERIAL

Karl Frank, Leverkusen, Germany, and Jan Jaeken, Hove, Belgium, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 13, 1967, Ser. No. 690,105
Claims priority, application Germany, Dec. 20, 1966, A 54426
Int. Cl. G03c 7/00
U.S. Cl. 96—54 6 Claims

Photographic color images having extremely good lightfastness are formed by converting a silver halide image to an image of a salt of a heavy metal that complexes with an organic complexing agent to make a strongly colored diffusion-resistant complex more light-fast than color coupler dyes. The heavy metal can be copper, chromium, manganese, iron, cobalt, nickel, palladium or platinum, or the like, and the organic complexing agent can have two different locations in its molecule for coordination with the metal. The silver halide is converted to the salt of the complexing heavy metal by applying to the silver halide image a differently colored or uncolored reactive complex of that metal having a disassociation constant larger than the corresponding complex of silver, so that the silver of the silver halide becomes bound by the reactive complex and liberates the heavy metal. It is also possible to go through two such reactive complex treatments to first convert the silver halide image to a mercury salt image, for example, and then convert the mercury salt image to an iron salt image, before the strongly colored light-fast final complex is formed. The organic complexing agent can be uniformly distributed in a light-sensitive silver halide emulsion, or it can be uniformly distributed in a layer adjacent that emulsion. After light-fast complex is formed, the unused complexing agent in such a layer can be complexed with a different metal ion to form a different color suitable for masking.

3,660,093

DRY AZIDO THERMAL DIFFUSION COPYING PROCESS

Erwin Ranz, Leverkusen; Helmut Kampfer, Cologne-Stammheim; Harald Von Rintelen, Leverkusen; Heinz-Dieter Schutz, Leverkusen; Dietmar Mayer, Leverkusen, and Klaus Sasse, Cologne-Stammheim, all of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed July 2, 1969, Ser. No. 838,637
Claims priority, application Germany, July 8, 1968, P 17 72 813.1
Int. Cl. G03c 5/54, 5/56, 5/18
U.S. Cl. 96—29 D 2 Claims

Positive copies are produced by a dry heat transfer process, whereby an imagewise exposed light-sensitive layer containing an organic azido compound is heated to transfer the azido compound from the unexposed areas to a reception layer and subsequent reaction to a visible positive image.

3,660,094

STABILIZATION OF PHOTOGRAPHIC SPIROPYRAN COMPOUNDS

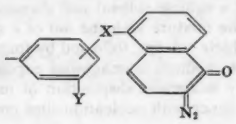
Albert Lucien Poot, Kontich, Belgium, assignor to Gevaert-AGFA N.V., Mortsel, Belgium

Filed June 22, 1970, Ser. No. 48,540
Claims priority, application Great Britain, July 8, 1969, 34,430/69
Int. Cl. G03c 5/24, 1/72
U.S. Cl. 96—48 8 Claims

Photographic images formed in a layer of photochromic material upon exposure to actinic light are stabilized so that a more permanent image is obtained by intimately mixing the photochromic material with a stabilizing agent of the formula:

wherein:

R_1 represents hydrogen, phenyl or phenyl substituted by at least one substituent taken from hydroxyl, carboxyl, halogen, amino, nitro, methoxy, aryloxy, pyridyl and quinone diazide groups, or wherein R_1 represents a substituent of the formula:



wherein:

X stands in ortho, meta or para-position with respect to the free bond of the phenyl group and represents —O·SO_2—, —NH—SO_2—, —O—CO— or —NH—CO— and Y is nitro or methoxy;

R_2 and R_3 represent a phenyl or naphthyl group carrying at least one hydroxyl, methylamine, naphthoquinone-diazidesulphonyloxy or -2-methyl-indolyl group; or

R_2 and R_3 together with the common carbon atom form a di- or tri-phenylmethane compound with ring closure over an oxygen atom, a sulphur atom, a sulphodioxide group or a substituted or unsubstituted nitrogen atom.

3,660,095

PHOTOGRAPHIC SILVER HALIDE COLOR MATERIAL UTILIZING BENZOYLACETAMIDE COLOR COUPLERS

Marcel Hendrik Verbrugghe, Wilrijk, and Arthur Henri De Cat, Mortsel, both of Belgium, assignors to Gevaert-AGFA N.V., Mortsel, Belgium

Filed June 27, 1969, Ser. No. 837,299
Claims priority, application Great Britain, July 18, 1968, 34,341/68
Int. Cl. G03c 7/00, 1/40
U.S. Cl. 96—55 8 Claims

Photographic materials are described comprising a light-sensitive silver halide emulsion layer and a benzoylacetamide color coupler capable of forming a yellow azomethine dye by reaction with an oxidized aromatic primary amino developing agent in which the benzoyl part of the color coupler contains at least one substituent of the formula:

$$RCF_2Q—$$

wherein:

R is hydrogen, fluorine or polyhaloalkyl, and

Q is oxygen, sulphur or sulphonyl.

These color couplers in light-sensitive silver halide emulsions provide photographic materials having improved light stability.

3,660,096

SPEED INCREASING ADDITIVES FOR NON-SILVER LIGHT SENSITIVE SYSTEMS

Eugene Wainer, Shaker Heights; Victor P. Petro, Brecksville; Robert D. Fox, University Heights; John E. Shirey, Wickliffe, and John A. Smerillo, Cleveland, all of Ohio, assignors to Horizons Incorporated

Filed July 19, 1968, Ser. No. 746,008

Int. Cl. G03c *1/52*

U.S. Cl. 96—90 **9 Claims**

Non-silver photographic compositions of the type described in U.S. Pat. No. 3,481,739 issued Dec. 2, 1969, are increased in photographic speed by the addition of one or more compounds from the group consisting of merocyanine dyes, polyphenylmethane carbinol bases and N-methyl diphenyl amines.

3,660,097

DIAZO-POLYURETHANE LIGHT-SENSITIVE COMPOSITIONS

Shashi B. Mainthia, New Rochelle, N.Y., assignor to Polychrome Corporation, on the Hudson, Yonkers, N.Y.

Filed Nov. 28, 1969, Ser. No. 880,918

Int. Cl. G03c *1/52, 1/64*

U.S. Cl. 96—91 **34 Claims**

Compositions comprising solvent-soluble, negative-acting and positive-acting light-sensitive diazonium compounds and synthetic, film-forming, solvent-soluble essentially linear polyurethane resins, which compositions can be coated onto suitable base sheet materials to form presensitized lithographic printing plates, proofs for multi-color printing, visual aids, printed circuits and the like.

ERRATUM

For Class 96—91 see:
Patent No. 3,660,581

3,660,098

PRODUCTION OF BINDER-FREE SILVER HALIDE ELEMENTS UTILIZING ELEMENTAL HALOGEN OR PLATINUM HALIDE

Russell P. Cook, Wellesley, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of application Ser. No. 615,962, Feb. 14, 1967, now abandoned. This application Jan. 7, 1969, Ser. No. 789,588

Int. Cl. G03c *1/02*

U.S. Cl. 96—94 **12 Claims**

Binder-free silver halide photosensitive strata are prepared by solution halogenation of binder-free silver strata. Mixed silver halides may be prepared by contacting the binder-free strata successively with different solutions of halogenating agents.

3,660,099

LIGHT-SENSITIVE SUPERSENSITIZED SILVER HALIDE PHOTOGRAPHIC EMULSIONS

Shui Sato, Hachioji-shi; Eiichi Sakamoto, Hanno-shi; Shizuo Saito, and Kaiichiro Sakazume, both of Tokyo, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Chuo-ku, Tokyo, Japan

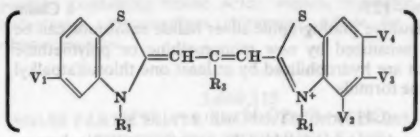
Filed June 9, 1969, Ser. No. 831,714

Claims priority, application Japan, June 10, 1968, 43/39449

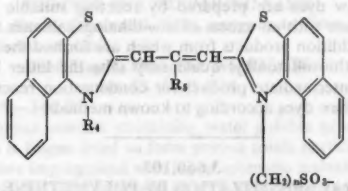
Int. Cl. G03c *1/14*

U.S. Cl. 96—100 **6 Claims**

A supersensitized light-sensitive silver halide photographic emulsion is obtained by incorporating in the emulsion a combination of two specific dyes having the general formulas I and II as indicated below.



I



II

3,660,100

DIRECT-PRINT LIGHT-DEVELOPABLE EMULSION

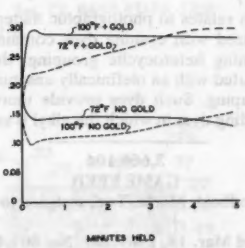
Robert E. Heeks, Penfield, and Donald P. Sullivan, Rochester, both of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Continuation-in-part of Ser. No. 641,135, May 25, 1967 and Ser. No. 707,483, Feb. 23, 1968, abandoned.

Filed Dec. 4, 1968, Ser. No. 782,789

Int. Cl. G03c *1/28*

U.S. Cl. 96—108 **4 Claims**



A photographic emulsion of the silver chlorobromide direct-print light-developable type containing lead and thallium salts. Optimum results may be obtained by addition of gold and iodide salts and certain spectral sensitizing dyes.

3,660,101

PHOTOGRAPHIC MATERIALS AND PROCESSES

James M. Owens; James L. Graham, both of Rochester, N.J., and Edward A. Pilsworth, Toronto, Ontario, Canada, assignors to Eastman Kodak Company, Rochester, N.Y.

Original application June 21, 1965, Ser. No. 465,736, now Patent No. 3,469,987. Divided and this application Apr. 30, 1969, Ser. No. 840,574

Int. Cl. G03c *1/08*; G03g *5/00*; C09b *11/00*

U.S. Cl. 96—120 **8 Claims**

Dispersions useful in spectrally sensitizing photographic materials are provided which comprise spectral sensitizing

dyes dissolved in a hydrophilic colloid. Methods for the preparation of such dispersions are also provided which feature dissolving the dye in an organic solvent, and adding the dye solution to the hydrophilic colloid.

3,660,102

SILVER HALIDE EMULSIONS SENSITIZED WITH METHINE DYES CONTAINING A THIOSULFATOALKYL GROUP

Oskar Riester, Leverkusen, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 1, 1970, Ser. No. 24,867

Claims priority, application Germany, Apr. 2, 1969, P 19 16 845.7

Int. Cl. G03c *1/10, 1/18*

U.S. Cl. 96—127 **1 Claim**

Light-sensitive photographic silver halide emulsions can be spectrally sensitized by new monomethine or polymethine dyes which are hydrophilized by at least one thiosulfatoalkyl group of the formula

$$-(CH_2)_n-S-SO_3H \text{ with } n = 1 \text{ to } 6.$$

These new dyes are prepared by reacting suitable heterocyclic bases with an excess of α,ω-dihalogenalkanes to form the 1:1 addition products from which are formed the heterocyclic ω-thiosulfatoalkyl quaternary salts the latter being a suitable intermediate product for condensation reactions to form the new dyes according to known methods.

3,660,103

SPECTRAL SENSITIZATION BY POLYMETHINE DYES WHICH CONTAIN AN UNSATURATED ALKYL SULFONIC ACID GROUP

Helmut Kampfer, Cologne-Stammheim; Oskar Riester, Leverkusen, and Johannes Gotze, Bergisch-Neukirchen, all of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of application Ser. No. 446,095, Apr. 6, 1965, now abandoned. This application Aug. 30, 1968, Ser. No. 756,368

Claims priority, application Germany, Apr. 21, 1964, A 45821

Int. Cl. G03c *1/08*

U.S. Cl. 96—137 **6 Claims**

The invention relates to photographic materials which are optically sensitized with cyanine dyes containing at least 1 nitrogen-containing heterocyclic grouping, the nitrogen of which is substituted with an olefinically unsaturated alkyl sulfonic acid grouping. Such dyes provide more sensitization than corresponding dyes in which the alkyl is saturated.

3,660,104

GAME FEED

Roy Herman Godbold, Marfa, Tex., assignor to Godbold, Inc., Marfa, Tex.

Filed Mar. 14, 1969, Ser. No. 807,424

Int. Cl. A23k *1/14, 1/02*

U.S. Cl. 99—4 **1 Claim**

A food block has been prepared for quail. Although this bird thrives on the block, said block is relatively unattractive to other birds and to animals.

3,660,105

CITRUS SEED CLOUDING AGENT FOR BEVERAGE BASES AND FOOD PRODUCTS

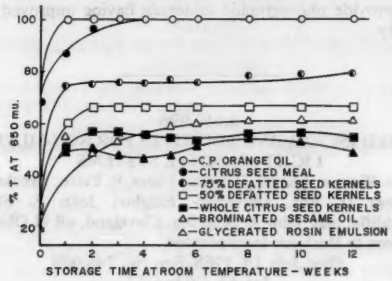
James W. Kesterson, Winter Haven, Fla.; Rudolph Hendrickson, deceased, late of Lake Alfred, Fla. (by Rosalind A. Hendrickson, heir), and Cedric D. Atkins, Winter Haven, Fla., assignors to State of Florida, Department of Citrus

Filed July 25, 1969, Ser. No. 844,984

Int. Cl. A23l *1/00;* **B01j** *13/00*

U.S. Cl. 99—28 **11 Claims**

Clouding agents are prepared from the whole seed kernels of citrus fruits by preparing a paste from the whole seed kernels, partially defatted seed kernels, seed meal in combination with citrus seed oil or other fats, and combining these



agents with water, gum acacia and the flavor oil from the citrus fruit to form an emulsion.

3,660,106

METHOD OF MAKING FLAKED ROAST AND GROUND COFFEE

Joseph R. McSwiggin, and Charles H. Brandt, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 12, 1969, Ser. No. 823,942

Int. Cl. A23f *1/00*

U.S. Cl. 99—65 **4 Claims**

A method of making flakes of roast and ground coffee wherein said flakes have a flake bulk density of from 0.38 grams/cc to 0.50 grams/cc, a flake thickness of from 0.008 inches to 0.025 inches and a flake moisture content of from 2.5 to 7.0 percent. The method comprises passing roast and ground coffee having a moisture content of from 2.5 to 7.0 percent through a roll mill having a roll diameter of from 6.0 inches to 30.0 inches, at a roll pressure of from 1,500 lbs./inch of nip to 5,000 lbs./inch of nip, at a roll surface temperature of from 50° F. to 200° F. and at a roll peripheral surface speed of from 100 ft./min. to 1,500 ft./min.

3,660,107

EFFERVESCENT BEVERAGE POWDER AND TABLETED BEVERAGE COMPOSITIONS

Frederick S. Mayer, San Rafael, Calif., assignor to Meyer Laboratories, Inc.

Filed Jan. 23, 1970, Ser. No. 5,376

Int. Cl. A23f *1/12;* **A23l** *1/00*

U.S. Cl. 99—66 **7 Claims**

A food mixture of an effervescent couple tartaric acid, citric acid plus sodium bicarbonate having the relative proportions 2:1:4 respectively and solid flavorant of coffee, decaffeinated coffee, tea or chocolate which upon the addition of water yields a beverage.

3,660,108

AGGLOMERATING GRANULAR MATERIAL

Edmar J. Mednis, Woodside, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Filed Feb. 19, 1970, Ser. No. 12,855

Int. Cl. A23f *1/08*

U.S. Cl. 99—71 **5 Claims**

An agglomerating technique in which a formulation containing a major amount of granular material and a minor amount of powdered material is throughly blended and fed through an agglomerator. This method provides a means for adjusting and controlling the bulk density of agglomerated products over ranges not readily obtained when agglomeration is performed with all powdered material.

3,660,109
PRODUCTION OF PARBOILED RICE
William A. Lay, Houston, Tex., assignor to Carus Chemical Company, Inc., LaSalle, Ill.
Filed Dec. 11, 1969, Ser. No. 884,382
Int. Cl. A23l *1/10*
U.S. Cl. 99—80 PS 5 Claims

Treating of rice grain, while still covered by its hull, with aqueous potassium permanganate prior to steaming of the rice in processes for producing parboiled rice. The permanganate treatment has the effect of fixing or destroying color bodies in the hull to prevent their migration onto the surface of the starchy endosperm in the subsequent steaming and drying steps and thus prevent color impartation to the parboiled rice.

3,660,110
METHOD FOR PRODUCING AN IMPROVED PUFFED CEREAL
William E. Holtz, Jr., Chicago, and Robert R. Reinhart, Des Plaines, both of Ill., assignors to The Quaker Oats Company, Chicago, Ill.
Filed Sept. 15, 1969, Ser. No. 858,100
Int. Cl. A23l *1/18*
U.S. Cl. 99—81 10 Claims

A process for improving whole grain puffed cereal products by reducing the moisture content of the whole grain puffed cereal product to a level of from 0.5 to 1.5 percent by weight based on the weight of the puffed whole grain and then allowing the moisture content to rise to packaging levels.

3,660,111
PROCESS FOR AFFECTING TASTE AND ODOR IN LEGUMINOSAE AND IN PARTICULAR PEANUTS AND SOYA BEANS
Karl-Hellmut Koch, 4 Hallbergstrasse, Dusseldorf, Germany
Continuation-in-part of application Ser. No. 477,316, Aug. 4, 1965, now abandoned. This application Dec. 18, 1969, Ser. No. 886,394
Int. Cl. A23l *1/20*
U.S. Cl. 99—98 9 Claims

The method for improving the taste and smell of legumins wherein the legumins are treated with an aqueous solution of a mixture of at least two acids selected from a group consisting of malic, lactic, tartaric, and citric acids in order to provide the improved taste and smell.

3,660,112
2-ALKYLTHIAZOLES AS TOMATO PRODUCT FLAVOR ENHANCERS
Stanley J. Kazeniac, Narberth, Pa., and Robert M. Hall, Haddonfield, N.J., assignors to Campbell Soup Company, Camden, N.J.
Filed Nov. 7, 1969, Ser. No. 870,462
Int. Cl. A23l *1/00*
U.S. Cl. 99—100 18 Claims

2-alkylthiazoles, and in particular, 2-isobutylthiazole, and their use as food additives for improving the aroma and flavor of tomato products.

3,660,113
PROCESS FOR PRODUCING POTATO CHIPS
Keng Chock Ng, 1020 Merced Street, Berkeley, Calif.
Filed Jan. 26, 1970, Ser. No. 5,966
Int. Cl. A23l *1/12*; A23b *7/04*
U.S. Cl. 99—100 P 2 Claims

Fried potato particles, frequently identified as potato chips or French fries, are prepared having an acceptable color, one from Color 4 through 7 of the Color Reference Standard of the International Potato Chip Institute by a method comprising freezing raw sliced potatoes followed immediately thereafter by thawing said slices in warm water and frying the thus treated slices.

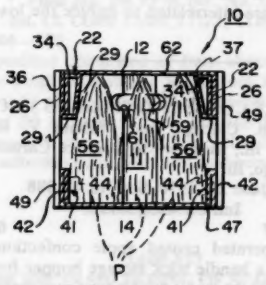
3,660,114
POULTRY FLAVOR COMPRISING AMINO ACIDS, SUGARS, VEGETABLE PROTEIN HYDROLYSATE AND 5'-RIBONUCLEOTIDES
Paul D. Thomas, Groton, Conn., assignor to Pfizer, Inc., New York, N.Y.
Filed Apr. 12, 1967, Ser. No. 630,188
Int. Cl. A23l *1/26*
U.S. Cl. 99—140 N 5 Claims

A method for preparing a synthetic chicken-flavored composition containing amino acids, sugars, vegetable protein hydrolysate, monosodium glutamate, edible fat and 5'-ribonucleotides.

3,660,115
SOLID PARTICULATE AROMATIC MATERIALS AND PROCESS FOR PREPARING SAME
Gilbert N. Revie, Cincinnati, Ohio, assignor to Fries & Fries Inc., Cincinnati, Ohio
Filed May 9, 1969, Ser. No. 823,530
Int. Cl. A23l *1/26*
U.S. Cl. 99—140 R 9 Claims

An aqueous mixture containing water soluble or dispersible solids is freeze dried to form porous solids particles. The particles are impregnated with liquid aromatic materials such as essential oils, flavoring oils, or perfumes. The impregnated particles are coated with a film-forming material to seal the liquid within the interstices of the solid particles. Flavor containing particles can be incorporated within dry beverage or gelatin mixes and perfume containing particles can be added to detergents.

3,660,116
VENTILATED STACKABLE CONTAINER
Frank E. Clark, Orinda, Calif., assignor to Container Corporation of America, Chicago, Ill.
Filed Sept. 15, 1969, Ser. No. 857,835
Int. Cl. B65d *85/30*, *5/08*
U.S. Cl. 99—171 R 4 Claims



A container is formed from a unitary cut and scored sheet of corrugated or other paperboard. The blank is folded along score lines and connected at a manufacturer's joint to provide top, bottom and opposed end panels. The top panel has side flaps extending therefrom folded upon themselves to provide tapered cellular structures giving good beam strength to a top panel. The bottom panel likewise has flaps extending therefrom and folded upon themselves to provide stiffening

of the bottom. The upper and lower stiffening structures are spaced to provide open sides of the container for ventilation of the contents. The sides of the end panels have flaps extending therefrom, and folded upon themselves to provide vertical stiffeners and good stacking strength.

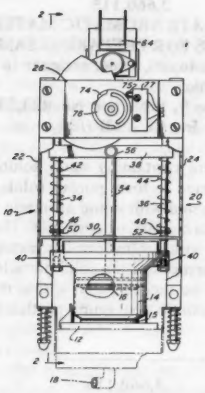
By reason of the tapered cellular structures the internal transverse cross-section of the container is essentially trapezoidal, making the container essentially suitable for tapered bundles of stalk vegetables, such as asparagus.

3,660,117

BEVERAGE BREWING APPARTUS

Raymond J. Neely, Montgomeryville, Pa., assignor to The Pennstar Company, Warminster, Pa.

Filed Dec. 4, 1970, Ser. No. 95,270
Int. Cl. A47j *31/00*
U.S. Cl. 99—289 **6 Claims**



Apparatus for use in brewing single cup quantities of a beverage from freshly ground charges of beverage material. A simplified apparatus is provided wherein the number of structural elements is greatly reduced and the expense of the entire apparatus is substantially less than that encountered with respect to prior apparatus. A series of cams is provided for operating the component parts of the apparatus and a motor for driving the cam shaft is provided. The profiles of the various cams are interrelated to reduce the load on the motor.

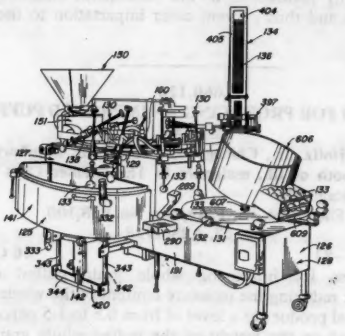
3,660,118

COATED APPLE CONFECTION MAKING MACHINE

Vito O. Raimondi, Chicago, and William V. Raimondi, Cicero, both of Ill., assignors to Beatrice Caramel Apple Co., Inc., Chicago, Ill.

Filed June 25, 1970, Ser. No. 49,888
Int. Cl. A23g *3/12*
U.S. Cl. 99—450.7 **62 Claims**

A cyclically operated coated apple confection making machine includes a handle stick storage hopper from which handle sticks are discharged one at a time at a first work station and are inserted automatically into handle stick-gripping and apple-holding devices, carried by a main movable endless or rotary turntable carrier, by which the handle sticks are automatically inserted into apples carried by a movable endless or rotary turntable apple carrier at a second apple pick-up work station. If an apple is not picked up at the second and apple pick-up work station the handle stick is automatically ejected from the handle stick-gripping and apple-holding device at a third work station. The handle sticks and attached apples are then moved through a caramel container in which they are rotated to coat the apples with a coating of caramel. The caramel-coated apples are then moved to a fifth work station where whey are lowered into and rotated in a first receptacle or tray for ground nuts so as to coat the caramel-coated apples with an outer coating of layer of ground nuts. The caramel-coated and ground nut-coated apples are then moved to a sixth work station at which the completed coated apple confections, with attached handle sticks, are discharged into a second receptacle or tray where they are given a further coating of ground nuts. The caramel container has a heating unit therebelow and the caramel container and its heating unit are automatically raised in small



increments relative to the handle stick-gripping and apple-holding devices as the rotational cycle of the main movable endless or rotary turntable carrier embodied in the machine progresses so as to assure an adequate coating of caramel on the apples as the supply of caramel in the caramel container is consumed in use. A nut storage hopper has a nut-grinding mechanism therein and ground nut level-responsive means in the first ground nut receptacle or tray, which is responsive to the level of ground nuts therein, controls the operation of the nut-grinding mechanism in such a manner as to assure an adequate supply of ground nuts in the first ground nut receptacle or tray at all times.

3,660,119

SILICATE BINDERS FOR ZINC-RICH PAINTS

Aaron Oken, R.D. #2, Sills Mills Road, Kennett Square, Pa.

Continuation-in-part of application Ser. No. 736,948, June 14, 1968, now abandoned. This application Apr. 14, 1970, Ser. No. 28,551
Int. Cl. C09d *5/10*
U.S. Cl. 106—1 **7 Claims**

New compositions of matter are made available which contain silicate esters and an alkaline material, the mixtures being kept anhydrous until their use. The compositions are zinc-rich paints, a silicate ester and an alkaline material mixture being mixed with zinc dust. Upon use, the blend is spread out as a coating. Upon exposure to the moisture in air, drying occurs rapidly with the formation of very hard finishes that greatly resist cutting by sharp edges.

3,660,120

FRICTION MATERIALS

Eric Clark, Stockport, and Roger Adrian Summerling, Leek, both of England, assignors to Ferodo Limited, Manchester, England

Filed May 14, 1968, Ser. No. 728,892
Claims priority, application Great Britain, May 15, 1967, 22,463/67
Int. Cl. C09k *3/14*
U.S. Cl. 106—36 **5 Claims**

A friction material comprising an inorganic fiber, such as asbestos, and a binder wholly or substantially wholly com-

posed of metallic sulphide formed in situ, the metallic sulphide consisting of iron sulphide formed by the reaction of sulphur with iron powder or with lower iron sulphide, with or without copper sulphide formed by reaction of sulphur with copper powder or with cuprous sulphide. Additional materials such as metallic powders, fillers, antioxidants and friction modifiers may be included in the friction material. The material may be formed by a method which comprises compacting and curing a mixture of ingredients which contains sulphur with iron powder or lower iron sulfide, optionally with copper powder or cuprous sulphide. Curing may be carried out under a pressure of from 2 to 20 tons per square inch in the temperature range of 80° C to 600° C depending on the proportions of the sulphides in the binder.

3,660,121

HOT TOP LINER AND REFRACTORY RING COMBINATION FOR USE WITH METAL HOT TOP CASING

James F. McCarthy, Mars, Pa., assignor to The Susquehanna Corporation, Fairfax, Va.

Filed Feb. 5, 1970, Ser. No. 9,083

Int. Cl. B28b *7/36*

U.S. Cl. 106—38.25 **11 Claims**

A combination of an exothermic insulting fiber and refractory ring for use in a metal hot top casing. The liner composition comprises by weight from 7–10 percent asbestos, from 7–12 percent wood flour, from 41–51 percent sand, from 26–32 percent silica flour and from 5–8 percent resin binder; and the refractory ring composition comprises by weight from 4.5–5.5 percent low water content asbestos, from 4.5–5.5 percent high water content asbestos, from 84–87 percent sand and from 4.5–6 percent resin binder.

3,660,122

HOT TOP LINER AND REFRACTORY RING COMBINATION FOR USE WITH METAL CASING THAT IS HOT

James F. McCarthy, Mars, Pa., assignor to The Susquehanna Corporation, Fairfax, Va.

Filed Feb. 5, 1970, Ser. No. 9,084

Int. Cl. B28b *7/36*

U.S. Cl. 106—38.25 **10 Claims**

A combination of an exothermic insulating liner and refractory ring for use in a metal hot top casing that is hot. The liner composition comprises by weight from 4 – 6% low water content asbestos, from 4 – 6% high water content asbestos, from 65 – 75% sand, from 12 – 16% silica flour and from 3 – 6% resin binder; and the refractory ring composition comprises by weight from 6 – 9% asbestos, from 87 – 90% sand and from 3 – 4.5% resin binder.

3,660,123

PRODUCTION OF ALPHA-QUARTZ-CRISTOBALITE SILICA FOR POTTERY

Albert Richard Smith, Redhill, England, assignor to British Industrial Sand Limited, Surrey, England

Filed Feb. 4, 1970, Ser. No. 8,613

Claims priority, application Great Britain, Feb. 5, 1969, 6,241/69

Int. Cl. C04b *33/00*

U.S. Cl. 106—39 R **7 Claims**

There is described a process for the production of silica for use as pottery body from silica sand. A mixture of the silica sand and from 0.3 to 2 percent by weight of the mixture of a calcium compound, calculated as calcium oxide, is calcinated at a temperature of from 1,200° to 1,550° C. for 5 to 60 minutes.

3,660,124

CERAMIC DIELECTRIC COMPOSITIONS COMPRISING CALCIUM, LANTHANUM AND LEAD TITANATES

Tsunehiko Yoshioka; Hisashi Satou, both of Hirasawa, Nikaho-machi, Yuri-gun, Akita-ken, and Naoki Suda, Kisagata-machi, Yuri-gun, Akita-ken, all of Japan, assignors to TDK Electronic Co., Ltd., Tokyo, Japan

Filed June 13, 1969, Ser. No. 832,988

Claims priority, application Japan, June 25, 1969, 43/43659; 43/43660

Int. Cl. C04b *33/00*

U.S. Cl. 106—39 R **9 Claims**

A ceramic dielectric composition consisting essentially of 45 to 95 mol percent of calcium titanate, 1 to 40 mol percent of lead titanate and 1 to 20 mol percent of lanthanum titanate is advantageous for use in temperature-compensating capacitors. Addition to the basic composition of 0.1 to 5 percent by weight of Ta_2O_5, WO_3 or CdO has the effect of broadening the temperature range for maturation, thus facilitating control of the firing conditions in the manufacture of the ceramic body.

3,660,125

BRIGHTENING PLASTICS WITH 2-ARYL-5-CYANONAPHTHOXAZOLE BRIGHTENERS

Bennett George Buell, Bound Brook, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Apr. 13, 1970, Ser. No. 28,146

Int. Cl. C08b *27/68;* **C08f** *45/67*

U.S. Cl. 106—176 **3 Claims**

Translucent plastics, particularly polyvinyl chloride, cellulose acetate, and polyolefins such as polyethylene are brightened by distributing uniformly therethrough about 0.01 to 0.5 percent by weight of a 2-aryl-5-cyanonaphthoxazole wherein the 2-aryl moiety is naphthyl, styrylphenyl, anisoylaminophenyl, carboxybenzoylaminophenyl, phenylureidophenyl or acylaminophenyl in which the acyl group is the residue of a higher fatty acid.

3,660,126

ASHPHALT COMPOSITIONS CONTAINING POLYAMIDE

Charles E. Moran, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 16, 1970, Ser. No. 3,530

Int. Cl. C08h *13/00, 17/22;* **C08j** *1/46*

U.S. Cl. 106—279 **4 Claims**

A composition comprised of from about 70 to about 95 percent by weight asphalt and from about 30 to about 5 percent by weight of N,N'-distearyl-ethylenediamide, preferably from about 85 to about 92 percent, and from about 15 to about 8 percent, respectively, has desirable properties with regard to softening point, viscosity, and penetration.

3,660,127

FLUX FOR USE IN SOLDERING OF STAINLESS STEELS

Lester Aronberg, Chicago, Ill., assignor to Lake Chemical Co., Chicago, Ill.

Filed Aug. 11, 1969, Ser. No. 849,174

Int. Cl. C09d *1/00*

U.S. Cl. 106—286 **12 Claims**

Fluxes for use in soldering stainless steels comprising compositions containing a major proportion of orthophosphoric acid and a minor proportion of a mono- or diammonium phosphate, or an amine mono- or diorthophosphate, advantageously in the presence of water, and desirably in admixture with various supplemental materials.

3,660,128

WAX-IN-WATER EMULSIONS

David B. Sheldahl, Griffith, Ind., assignor to Atlantic Richfield Company

Filed Nov. 29, 1967, Ser. No. 686,686
Int. Cl. C08h 9/08
U.S. Cl. 106—271 7 Claims

This invention relates to the composition of an emulsion and a method of producing a stable, wax semi-solid by aeration of the emulsion. The emulsion contains wax, water, a primary mono or secondary dialkanolamine, and an aliphatic monocarboxylic acid in the proportions of about 25 to 75 weight percent water, about 20 to 65 weight percent of a normally solid hydrocarbon wax, about 1 to 15 weight percent of the alkanolamine, and about 3.5 to 15 weight percent of the acid. The aeration can be accomplished with a relatively inert gas.

3,660,129

PROCESS FOR THE MANUFACTURE OF A FREE-FLOWING TITANIUM DIOXIDE PIGMENT

Hans Hermann Luginsland, Opladen, Germany, assignor to Titangesellschaft mbH, Leverkusen, Germany

Filed May 15, 1970, Ser. No. 37,859
Claims priority, application Germany, May 27, 1969, P 19 26 905.7
Int. Cl. C09c 1/36
U.S. Cl. 106—300 4 Claims

A free-flowing titanium dioxide pigment is prepared by employing the following process steps:

1. coating the titanium dioxide pigment with hydrous oxides;
2. sand milling the coated pigment ; and
3. drying the sand milled pigment in a spray drier.

3,660,130

CHROME PIGMENTS

Charles Harold Buckley; Geoffrey Lionel Collier, and John Mitchell, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed May 11, 1970, Ser. No. 36,472
Claims priority, application Great Britain, Sept. 3, 1969, 43,584/69
Int. Cl. C09c 1/20; C08h 17/04
U.S. Cl. 106—302 7 Claims

Chrome pigments of improved durability, especially to atmospheric sulphurous acid, are obtained by adding to a stirred aqueous suspension of a chrome pigment at an initial pH between 1.8 and 8.0 a source of silicate ions, a source of trivalent antimony ions, and oxalic acid, and adjusting the pH to between 5 and 10.5 by addition of a water-soluble basic compound.

3,660,131

SATIN WHITE PROCESS AND PRODUCT

Margaret H. Murray, Stamford, and Earl E. Brodhag, Westport, both of Conn., assignors to Time, Incorporated, New York, N.Y.

Filed Nov. 10, 1969, Ser. No. 875,531
Int. Cl. C09c 1/02
U.S. Cl. 106—306 3 Claims

Satin white coating pigment of improved uniformity which gives paper coatings having improved physical properties can be prepared by slowly adding an aqueous solution of alum or aluminum sulfate to a stirred aqueous dispersion containing slaked lime or calcium hydroxide and sodium hydroxide.

3,660,132

PROCESS OF MAKING A HIGHLY DISPERSED MIXTURE OF CARBON BLACK AND SILICIC ACID

Alfred Illigen, Heerbrugg, Switzerland, and Walter Neugebauer, Constance/Bodensee, Germany, assignors to Deutsche Gold-und Silber-Scheideanstalt Vormals Roessler, Frankfurt, Germany

Filed Sept. 24, 1970, Ser. No. 75,130
Claims priority, application Germany, Sept. 25, 1969, P 19 48 443.6
Int. Cl. C09c 1/48
U.S. Cl. 106—307 11 Claims

A highly dispersed homogeneous mixture of activated carbon black and activated silicic acid is formed by subjecting gaseous silicon monoxide or a mixture thereof with a gaseous metal oxide to the action of a gaseous oxidizing agent and passing substantially simultaneously a material that forms carbon black upon decomposition into the oxidizing zone or into the stream of gas right above the oxidizing zone.

3,660,133

PROCESS FOR THE MODIFICATION OF CARBON BLACK

Abraham Van Der Schuyt, Hilversum, and Kornelis Gerrit Wolthuis, Amsterdam, both of Netherlands, assignors to Koninklijke Zwavelzuurfabrieken v/h Ketjen N.V.

Filed May 26, 1969, Ser. No. 827,896
Claims priority, application Netherlands, May 30, 1968, 6807617
Int. Cl. C09c 1/44
U.S. Cl. 106—307 8 Claims

Carbon black, in the dry state, is reacted with gaseous sulphur trioxide to increase the ability of the resulting modified carbon black to impart long flow characteristics to printing inks in which it is employed as pigment without increasing the content of volatile substances and without affecting the other pigment properties of the carbon black.

3,660,134

INORGANIC MATERIALS SURFACE REACTED WITH ORGANO TITANIUM COMPOUNDS

Horton H. Morris, and James P. Olivier, both of Macon, Ga., assignors to Freeport Sulphur Company, New York, N.Y.

Filed Oct. 30, 1969, Ser. No. 872,730
Int. Cl. C09c 3/00
U.S. Cl. 106—308 Q 8 Claims

Inorganic materials in particulate or fibrous form the surfaces of which have been reacted with an organo titanium compound are described. The products are particularly suitable as fillers in solvent coating compositions and as settling aids for oil.

3,660,135

LININGS FOR INGOT MOLDS AND FOUNDRY MOLDS

Henry Nouveau, Corbeil-Essonnes, France, assignor to Doittau Produits Metallurgie Societe a Responsabilite Limitee, Corbeil-Essonnes, France

Filed July 9, 1969, Ser. No. 840,480
Claims priority, application France, Aug. 1, 1968, 161564
Int. Cl. B29c 1/04
U.S. Cl. 117—5.1 2 Claims

An exothermic ingot mold lining is water insoluble and can be formed by filtration, but at the same time has high reactivity, and comprises by weight refractory material 35 to 60 percent, asbestos 3 to 7 percent, wood flour 4 to 10 percent, manganese dioxide 11 to 21 percent, cryolite 0.5 to 7 percent, fluorspar 0.5 to 6 percent, binder 4 to 7 percent, and powdered aluminum 10 to 32 percent, the aluminum substantially all passing a No. 45 screen and including 10 to 70 percent that passes a No. 250 screen. The aluminum is thus a mixture of fine and coarse powder.

ERRATUM

For Class 117—8 see:
Patent No. 3,660,347

3,660,136

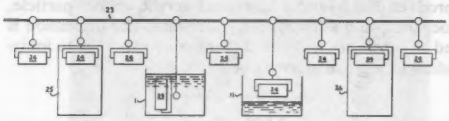
METHOD OF COATING SLOTTED ARTICLES

Lawrence J. Guilbault, Akron, Ohio, and David G. Schwenker, Columbia, S.C., assignors to General Electric Company

Continuation of application Ser. No. 765,807, Oct. 8, 1967, now abandoned. This application Nov. 23, 1970, Ser. No. 92,286

Int. Cl. B44d *1/095*

U.S. Cl. 117—17 **3 Claims**



A method of applying a powdered coating composition to solid slotted articles comprising the steps of: preheating the article to the sintering temperature of the composition, coating the article in a conventional fluidized bed of the coating composition, cooling the article to ambient temperature, and coating the article in an electrostatic fluidized bed of the coating composition. The method may advantageously be utilized to apply an integral insulation to the deep, narrow winding slots of a dynamoelectric machine armature or stator.

3,660,137

HEAT-REFLECTING GLASS AND METHOD FOR MANUFACTURING THE SAME

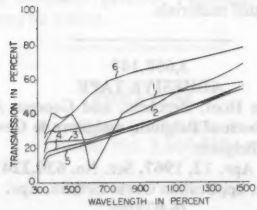
Shigemasa Furuuchi, and Katsuaki Aikawa, both of Kanagawa-ken, Japan

Filed June 13, 1969, Ser. No. 832,991

Claims priority, application Japan, June 25, 1968, 43/43597

Int. Cl. C03c *17/10*

U.S. Cl. 117—33.3 **6 Claims**



On the surface of a glass substrate is formed by hydrolysis or thermal decomposition a light-transmissive film of a metallic oxide having a refractive index higher than that of glass and colloidal particles of metallic palladium or of metallic palladium and metallic gold, said particles being uniformly dispersed in said metallic oxide. The film has the transmission color of bluish gray, neutral gray or yellowish gray and is capable of reflecting about 30 to 40 percent of solar energy radiation. The film also has superior mechanical strength and chemical stability, so that glass having such a film can be successfully used as a heat-reflecting glass in single-pane installations.

3,660,138

METALLIZED ARTICLE

John H. Gorrell, Billerica, Mass., assignor to King Seeley Thermos Co., Ann Arbor, Mich.

Filed Feb. 5, 1969, Ser. No. 796,930

Int. Cl. B44d *1/12, 1/02*

U.S. Cl. 117—35 V **2 Claims**

Fibrous article with heat-and-light reflecting quality provided by a metal coating. The metal coating is overcoated with a mixed resin system. The article thus produced has enhanced stability of the fibrous substrate due to the heat and light protection provided by the coatings and also has enhanced strength due to the coatings consistent with substantially retaining hand and softness of the fibrous article. The metal coating is uniquely abrasion and mar resistant, water repellent and launderable and dry cleanable consistent with high moisture vapor transmission of the article (breathability).

3,660,139

PROCESS FOR TITLING POSITIVE OR NEGATIVE PHOTOGRAPHIC FILM

James S. Gerhardt, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of application Ser. No. 678,196, Oct. 26, 1967, now abandoned. This application June 15, 1970, Ser. No. 46,449

Int. Cl. B41c *1/08, 1/00*

U.S. Cl. 117—38 **9 Claims**

A method for titling negative or positive photographic film with a minimum of film base embossing comprising the steps of:

a. providing a titling element comprising a polymeric support having first and second support surfaces and coated upon said first support surface, to provide a printing surface, a layer comprising prolamine, film forming promoter, plasticizer and pigment;

b. juxtaposing the photographic film and the titling element, the printing surface of the titling element being adjacent the photographic film;

c. striking the second support surface of the titling element with heated type to bring the printing surface of the titling element into contact with the photographic film for a period of time sufficient to transfer selective portions of the printing surface having the configuration of the heated type to the photographic film without transfer of any portion of the polymeric support; and

d. withdrawing the printing surface of the titling element from the photographic film to leave the selective portions of the printing surface on the photographic film.

3,660,140

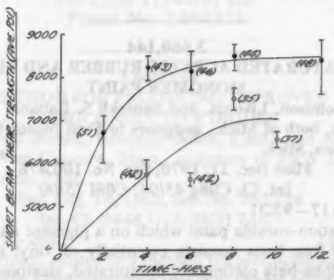
TREATMENT OF CARBON FIBERS

Daniel A. Scola, Glastonbury, and Hilton A. Roth, Cheshire, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed June 18, 1970, Ser. No. 47,490

Int. Cl. C01b *31/07;* **B44d** *1/092*

U.S. Cl. 117—47 R **8 Claims**



A method of treating high modulus, high strength carbon fiber to improve its bonding characteristics in a resin matrix

comprising immersing the fiber in concentrated nitric acid for 4–8 hours at refluxing temperature.

3,660,141

PRODUCTION OF FILMS HAVING EXCELLENT ADHESIVENESS TO GELATINS

Mitsuo Yoshiyasu; Sadao Saito, and Yoshio Miyabe, all of Yokkaichi-shi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo-to, Japan

Filed Dec. 3, 1969, Ser. No. 881,861

Claims priority, application Japan, Dec. 10, 1968, 43/89932

Int. Cl. B44d *1/14;* **B32b** *27/08*

U.S. Cl. 117—76 F **8 Claims**

A filler-blended polyolefin film is treated with a solution of acrylic ester polymer in a positive solvent which can at least swell the polyolefin, and the film in contact with the solvent in the solution is heated to the temperature of at least 50° C. After removal of the solvent, a film to which gelatins are adhesive is obtained, which film comprises the polyolefin film substrate and a layer of acrylic ester polymer adhering to the substrate.

3,660,142

METHOD OF MAKING A PHOTOGRAPHIC BASE MATERIAL

Tsuneo Kasugai, Shizuoka, and Wataru Ueno, Kanagawa, both of Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara-Kamigun, Kanagawa, Japan

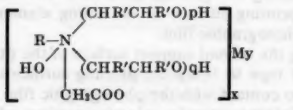
Filed June 9, 1970, Ser. No. 44,872

Claims priority, application Japan, June 9, 1969, 44/45271

Int. Cl. B44d *1/44*

U.S. Cl. 117—93.1 CD **9 Claims**

Improving the wettability of photographic base material by incorporating therein a small amount of a compound having the formula



3,660,143

ACRYLIC RUBBER-URETHANE-ACRYLATE PAINT AND PAINTING PROCESS

Olin B. Johnson, Livonia, and Santokh S. Labana, Dearborn Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 21, 1970, Ser. No. 100,477

Int. Cl. C08g *41/04, 22/00*

U.S. Cl. 117—93.31 **12 Claims**

A radiation-curable paint binder dispersion comprises the addition product of a hydroxy-functional acrylic rubber particle, a diisocyanate and a hydroxyalkyl acrylate and vinyl monomers. The dispersion is applied to a substrate as a paint film and cured thereon by exposure to an electron beam.

3,660,144

UNSATURATED ACRYLIC RUBBER AND VINYL MONOMER PAINT

Olin B. Johnson, Livonia, and Santokh S. Labana, Dearborn Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 21, 1970, Ser. No. 100,478

Int. Cl. C08g *45/04;* **C08f** *15/00*

U.S. Cl. 117—93.31 **12 Claims**

A radiation-curable paint which on a pigment and particulate filler-free basis consists essentially of vinyl monomers and an alpha-beta olefinically unsaturated, elastomeric particle of crosslinked acrylic polymer. The coating is applied as a film-forming dispersion to the surface of a substrate and cured thereon by ionizing radiation, e.g., an electron beam. This application is further directed to articles of manufacture coated with this paint using this process of curing.

3,660,145

EPOXY RESIN AND ACRYLIC RUBBER-URETHANE-ACRYLATE PAINT AND PAINTING PROCESS

Olin B. Johnson, Livonia, and Santokh S. Labana, Dearborn Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 21, 1970, Ser. No. 100,493

Int. Cl. C08g *45/04, 41/04*

U.S. Cl. 117—93.31 **10 Claims**

A radiation-curable paint binder dispersion comprises vinyl monomers, an alpha-beta olefinically unsaturated epoxy resin having molecular weight in excess of about 370, and an addition product of a hydroxy-functional acrylic rubber particle, a diisocyanate and a hydroxyalkyl acrylate. The dispersion is applied to substrates and cured thereon by exposure to ionizing radiation, e.g., an electron beam.

3,660,146

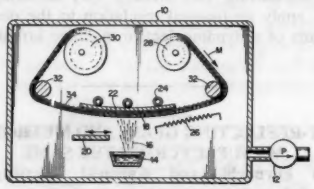
METHOD OF COATING STIFF MATERIALS ONTO FRAGILE, HEAT VULNERABLE SUBSTRATE WEBS

Earl E. Chadsey, Jr., Sudbury, and Frank Feakes, Lexington, both of Mass., assignors to National Research Corporation

Filed Sept. 29, 1969, Ser. No. 861,585

Int. Cl. C23c *11/00, 13/00, 13/10*

U.S. Cl. 117—106 R **3 Claims**



Stiff materials such as boron and boron carbide are coated onto a polymeric or thin metal heated substrate web, backed by a screen carrier web and passing over an evaporant source of the coating material. The screen is transparent to radiation.

The present invention relates to coating of continuous substrate webs with stiff materials.

3,660,147

ADHESIVE TAPE

Albert Emiel Van Hoof, Berchem, and Georges Arthur Holvoet, Mortsel, both of Belgium, assignors to Gevaert-AGFA N.V., Mortsel, Belgium

Filed Apr. 12, 1967, Ser. No. 630,224

Claims priority, application Great Britain, Apr. 12, 1966, 16,078/66

Int. Cl. C09j *7/02, 7/04;* **D21h** *1/38*

U.S. Cl. 117—122 PA **4 Claims**

An adhesive tape carrying a layer of a water-soluble adhesive composed of a homogeneous mixture of at least one water-soluble polymer and as an elasticizing agent a derivative of a polyol having at least three hydroxyl groups at least one of which is replaced by a hydroxyalkylene ether group, all of the hydroxyl groups of such derivative either remaining as free hydroxyl groups or being replaced by inert alkoxy groups. Preferably, the amount of the polyol derivative elasticizing agent is 25–100 percent by weight of the water-soluble polymer. The tape is characterized by tenacious adherence to surfaces of film or paper and removal with water.

3,660,148

TREATMENT OF ASBESTOS

Gordon F. Heron, Rochdale, England, assignor to Turner Brothers Asbestos Company Limited, Manchester, England

Filed Jan. 9, 1970, Ser. No. 1,665
Claims priority, application Great Britain, Jan. 10, 1969, 1,579/69
Int. Cl. B32b *19/02, 19/08*
U.S. Cl. 117—126 AB 6 Claims

The invention comprises treating asbestos cloth and other asbestos products to reduce the dust emitted by them during handling and use. This is done by distributing a small amount of polymeric particles throughout the product to bond the fibers to one another, while leaving the properties except the dustiness essentially unchanged. The preferred method consists in impregnating asbestos cloth with an aqueous emulsion or suspension of the polymeric material and removing the water.

3,660,149

COATED FOAMED ALUMINUM BODY

Michael E. Kucsma, and Wallace W. Parker, both of Baton Rouge, La., assignors to Ethyl Corporation, New York, N.Y.

Filed Oct. 24, 1969, Ser. No. 869,344
Int. Cl. B32b *5/18, 15/08*
U.S. Cl. 117—132 C 8 Claims

Foamed aluminum bodies are coated with a polyvinyl chloride composition, the composition being a mixture of polyvinyl chloride made by a suspension process and that made by an emulsion process. Pigments, stabilisers and plasticizers may be added.

ERRATUM

For Class 117—136 see:
Patent No. 3,660,582

3,660,150

COATED WOVEN MATERIALS

Michael Lakin Cooper, Welwyn Garden City, England, assignor to Imperial Chemical Industries Limited, London, England

Filed May 21, 1970, Ser. No. 39,550
Claims priority, application Great Britain, June 2, 1969, 27,720/69; 27,721/69
Int. Cl. B44d *1/00;* D03d *1/04*
U.S. Cl. 117—138.8 E 5 Claims

A web of woven tapes of crystalline polyolefines coated with a blend containing at least 10 percent by weight of a crystalline polyolefine.

3,660,151

POLYESTER YARNS FOR REINFORCING RUBBER ARTICLES

Richard David Weimar, Jr., Grifton, N.C., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of application Ser. No. 819,470, Apr. 25, 1969, now abandoned. This application Mar. 16, 1970, Ser. No. 20,147
Int. Cl. B32b *27/02;* B32p *27/36;* B44d *1/14*
U.S. Cl. 117—138.8 F 5 Claims

An improvement is disclosed in high-strength polyester yarn for use in reinforced rubber articles such as tires. When drawn filaments of polyethylene terephthalate having a relative viscosity of 40 or more are heated in contact with rubber, degradation is caused by amine-producing accelerators commonly used in rubber compounds. This degradation is prevented by a durable surface coating on the polyester of a salt of a metal having a atomic number of 22–30 or 40–48, such as zinc sulfate or ferric ammonium sulfate.

3,660,152

COATED WOVEN MATERIALS

Michael Lakin Cooper, Welwyn Garden City, England, assignor to Imperial Chemical Industries Limited, London, England

Filed May 21, 1970, Ser. No. 39,551
Claims priority, application Great Britain, June 2, 1969, 27,719/69
Int. Cl. B44d *1/00;* D03d *1/04*
U.S. Cl. 117—138.8 E 5 Claims

A woven web of tapes made from a blend of from 50 to 90 percent of a crystalline polyolefine and from 10 to 50 percent of another polyolefine coated with a polyolefine based coating composition.

3,660,153

LIGHT-INTERCEPTING COMPOSITION FOR PHOTOGRAPHIC LIGHT-SENSITIVE FILM

Yoshihiro Seto, Ashigara-Kamigun, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Ashigara-Kamigun, Kanagawa, Japan

Filed Jan. 27, 1969, Ser. No. 794,010
Claims priority, application Japan, Jan. 26, 1968, 43/4696
Int. Cl. D21h *1/28;* G03c *1/86*
U.S. Cl. 117—155 UA 7 Claims

Light-intercepting composition consisting of an ethylene-vinyl acetate copolymer having dispersed therein carbon black. In film form, the composition is laminated to a paper to provide a light-intercepting paper for use in photographic light-sensitive roll film.

ERRATUM

For Class 117—161 see:
Patent No. 3,660,371

3,660,154

METHOD FOR PRODUCING IMPROVED SEMICONDUCTIVE DIODES

John A. Scott-Monck, Redondo Beach, Calif., and Arthur J. Learn, West Concord, Mass., assignors to TRW Inc., Redondo Beach, Calif.

Filed Aug. 15, 1968, Ser. No. 752,756
Int. Cl. B44d *1/18;* H01l *7/00*
U.S. Cl. 117—200 11 Claims

This invention relates to a method for producing improved polycrystalline semiconductive thin film diodes having an in-

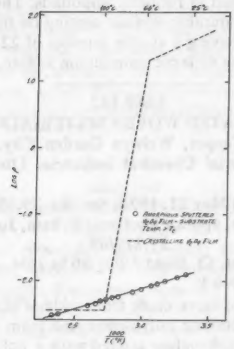
creased interfacial barrier height and an increased rectification ratio. The improved diodes are obtained by treating the surface of the polycrystalline semiconductive sulfur compound with an excess of elemental sulfur.

3,660,155

METHOD FOR PREPARING SOLID FILMS

John D. Mackenzie, Los Angeles, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Apr. 15, 1970, Ser. No. 28,841
Int. Cl. C23c *13/00, 15/00;* **C23f** *17/00;* **C23b** *5/50*
U.S. Cl. 117—201 **4 Claims**



The electrical discontinuity which appears in the temperature response of certain materials when they are in crystalline form and are at characteristic transitional temperatures is suppressed by depositing the material on a substrate which is maintained at a temperature low enough to cause the resulting film to be amorphous. Also, by utilizing temperatures on either side of the transitional temperature, for example, new and different resistivity versus temperature responses may be realized which do not inhibit the semiconductor-metal transition.

3,660,156

SEMICONDUCTOR DOPING COMPOSITIONS

John George Schmidt, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 19, 1970, Ser. No. 65,358
Int. Cl. H01l *3/00*
U.S. Cl. 117—201 **19 Claims**

The disclosure herein relates to semiconductor doping compositions and to methods for their preparation and use. More particularly, the disclosure relates to liquid silica-based doping compositions which may be applied to a surface of a semiconductor substrate and, upon heating, an impurity is diffused from a film of the doping composition into the substrate to form a region therein having the desired electrical properties.

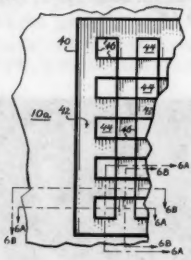
3,660,157

ENHANCED CONTRAST SEMICONDUCTOR WAFER ALIGNMENT TARGET

Philippe Villers, Concord; Martin A. Allen, Sudbury, and James M. Mulvaney, Southboro, all of Mass., assignors to Computervision Corporation, Waltham, Mass.

Filed Aug. 18, 1969, Ser. No. 850,883
Int. Cl. H01l *7/00*
U.S. Cl. 117—212 **5 Claims**

An enhanced contrast semiconductor wafer alignment target for use in automatic, light balanced, null seeking, servocontrolled mask-to-wafer aligners. The target has a line border which differs sharply in its light reflecting characteristic from the surrounding surface of the semiconductor wafer. Within the target area defined by the line border are a plurality of light reflecting and light removing areas arranged,



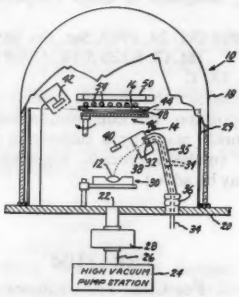
preferably, in alternating sequence to form a checkerboard or parallel line pattern. For semiconductor wafers in which the target cannot be formed in an overlying, electrically insulative layer because of the subsequent removal of the layer, the target is etched directly into the semiconductor materials.

3,660,158

THIN FILM NICKEL TEMPERATURE SENSOR AND METHOD OF FORMING

Arthur C. M. Chen, and James M. Lommel, both of Schenectady, N.Y., assignors to General Electric Company

Filed Dec. 30, 1968, Ser. No. 787,685
Int. Cl. B44d *1/18*
U.S. Cl. 117—217 **5 Claims**



Thin film nickel temperature sensors having a temperature coefficient of resistance of above +0.2 percent/° C and a resistance above 0.35 ohms per square are formed by electron beam evaporation of a high purity nickel source at pressures below 8×10^{-6} torr and deposition of the evaporated nickel atop a dielectric substrate, e.g. a polyimide film, heated above 60° C. The nickel film preferably is deposited to a thickness between 250 A and 3,000 A and masking is employed to produce a desired configuration in the deposited nickel film. To stabilize the resistance of the deposited nickel film, a dielectric encapsulant such as alumina, silica, a polyimide or a fluorocarbon then is overlayed upon the film by conventional vacuum deposition or bonding techniques.

3,660,159

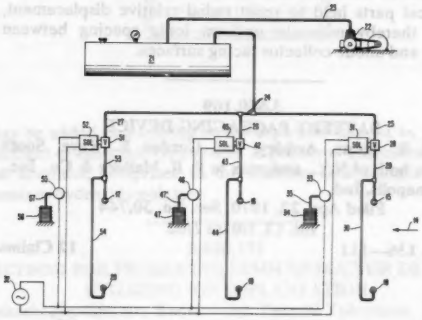
METHOD FOR METERING A CLEANING SOLUTION FOR A VEHICLE WHEEL

Clyde F. Larkin, Jr., 285 Taylor Drive, Lexington, Ky.

Original application Sept. 27, 1968, Ser. No. 763,067, now Patent No. 3,602,236, dated Aug. 31, 1971. Divided and this application Nov. 30, 1970, Ser. No. 93,523

Int. Cl. B08b *3/04*

U.S. Cl. 134—32 10 Claims



Linearly spaced spray nozzles are disposed on opposite sides of a vehicle path for spraying a cleaning solution on the wheels of a vehicle. As the vehicle wheel engages a trip mechanism for each pair of aligned nozzles, a portion of the area of the wheel is sprayed with the cleaning solution. A predetermined quantity of the cleaning solution is metered through each of the spray nozzles irrespective of the time that the wheel remains in engagement with the trip mechanism.

3,660,160

DISSOLUTION OF POLYMERS

Kenneth W. Powers, Berkeley Heights, and George E. Serniuk, Roselle, both of N.J., assignors to Esso Research and Engineering Company

Filed Dec. 31, 1969, Ser. No. 889,697

Int. Cl. B08b *7/00*, *9/00*; C23g *5/00*

U.S. Cl. 134—22 14 Claims

Dissolution of cross-linked polymer gels is effected by use of Lewis acids plus Lewis salts.

3,660,161

METHOD FOR INSERTING MATERIAL INTO THE APERTURES OF AN APERTURED WORKPIECE

Helmut Emil Durr, Chatham Township, Morris County, and Albert Heinz Haller, Clark, both of N.J., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed June 6, 1969, Ser. No. 831,001

Int. Cl. H01m *35/26*, *7/00*

U.S. Cl. 136—67 9 Claims

This disclosure is directed to methods of and apparatus for inserting a material, e.g., the reactive paste used in secondary batteries, into the apertures of an apertured workpiece, e.g., the plate or grid element of a secondary battery, wherein the material to be inserted is deposited on the workpiece, an insertion means, e.g., a roller, is advanced toward the workpiece against the material, and the insertion means is displaced over the surface of the workpiece against the material concurrently with the advancement of the insertion means.

3,660,162

GALVANIC CELL

Morris Eisenberg, Palo Alto, Calif., assignor to Electrochemica Corporation, Menlo Park, Calif.

Filed Mar. 27, 1970, Ser. No. 23,463

Int. Cl. H01m *17/00*

U.S. Cl. 136—83 R 25 Claims

A galvanic cell is disclosed comprising spaced cathodic and anodic electrodes and an electrolyte having an organic aprotic solvent and a soluble solute such as a Lewis acid. At least one of the electrodes has a conductive support member comprising a metal selected from the group consisting of aluminum, magnesium and beryllium.

3,660,163

SOLID STATE LITHIUM-IODINE PRIMARY BATTERY

James R. Moser, Shrewsbury, Pa., assignor to Catalyst Research Corporation, Baltimore, Md.

Filed June 1, 1970, Ser. No. 41,801

Int. Cl. H01m *21/00*

U.S. Cl. 136—83 R 21 Claims

A substantially anhydrous solid state battery has a lithium anode, a solid lithium iodide electrolyte and an electronically conductive cathode containing iodine, such as organic iodine charge transfer complexes.

3,660,164

PRIMARY CELL UTILIZING HALOGEN-ORGANIC CHARGE TRANFER COMPLEX

Allen M. Hermann, La Canada, Calif.; Felix Gutmann, W. Pennant Hills, New South Wales, Australia, and Alan Rembaum, Altadena, Calif., assignors to California Institute Research Foundation, Pasadena, Calif.

Continuation of application Ser. No. 643,883, June 6, 1967, Continuation-in-part of application Ser. No. 556,900, June 13, 1966, now abandoned. This application July 2, 1969, Ser. No. 845,616

Int. Cl. H01m *15/00*

U.S. Cl. 136—83 R 6 Claims

Primary cells capable of operating essentially in the solid state and utilizing reaction of a halogen with a metallic anode employ as cathode a charge transfer complex in which the acceptor component is the halogen and the donor component is an organic compound, typically aromatic or heterocyclic. Preferred anode materials include magnesium, calcium and barium.

The maximum current produced by such cells can be increased by surrounding them with an atmosphere containing more than the normal partial pressure of water vapor, or containing vapor of an organic liquid such alcohol, acetone and acetonitrile, having a high dielectric constant.

The physical properties of the charge transfer complex is improved by incorporating a polymeric matrix, which may or may not act also as the donor component of the complex.

3,660,165

ELECTRODES COMPRISING FLUORINATED PHOSPHONITRILE POLYMER AND FUEL CELL IN COMBINATION THEREWITH

Nigel I. Palmer, Port Washington, N.Y., assignor to Leesona Corporation, Warwick, R.I.

Filed Apr. 22, 1970, Ser. No. 30,948

Int. Cl. H01m *27/04*, *13/00*

U.S. Cl. 136—86 D 31 Claims

Lightweight electrodes for use in an electrochemical device are described. In one embodiment the lightweight electrodes comprise a catalyst layer including an admixture of catalyst and a fluorinated phosphonitrile polymer. In another embodiment the hydrophobic backing layer is a continuous film of fluorinated phosphonitrile polymer with a contiguous layer of catalyst thereon. The catalyst can also be admixed and bound with particles comprising the same

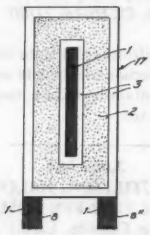
fluorinated phosphonitrile polymer used as the backing layer, derivatives of the polymeric material or other hydrophobic polymers such as polytetrafluoroethylene. The electrode is adapted to be disposed in an electrochemical cell with the catalytic layer in contact with the cell electrolyte.

3,660,166

GAS DIFFUSION ELECTRODE

August Winsel, Kelkheim, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany and Varta Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 14, 1967, Ser. No. 623,109
Claims priority, application Germany, Mar. 17, 1966, S 102563
Int. Cl. H01m *27/04, 13/00*
U.S. Cl. 136—86 D **12 Claims**



Catalytic electrode having improved heat dissipating means. The electrode embodies a foraminous metallic web having deposited over major portions of its surfaces porous catalytic material framed within gasket material and essentially having sufficient web surface exposed to effectively remove heat from the electrode during its operation in a fuel cell or other exothermic catalytic processes.

3,660,167

ALKALINE DRY CELL

Cho Kin Ching, 599 West 190th Street, New York, N.Y.; Walter Cohen, 13 Fletcher Drive, Morganville, N.J., and Stanley Tseng, 945 West End Avenue, New York, N.Y.

Filed Nov. 4, 1970, Ser. No. 86,799
Int. Cl. H01m *21/00*
U.S. Cl. 136—107 **8 Claims**

An alkaline dry cell of high energy density in which a cathode of powdered manganese dioxide, carbon, and graphite has dispersed throughout it, short filaments of stainless steel, long filaments of stainless steel, and stainless steel powder.

3,660,168

LEAK-PROOF PRIMARY CELL

Robert E. Ralston, Spring Valley, and Yung Ling Ko, Peekskill, both of N.Y., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Apr. 9, 1970, Ser. No. 26,911
Int. Cl. H01m *21/00*
U.S. Cl. 136—107 **18 Claims**

A leak-proof electrochemical cell having a cylindrical can closed on its bottom end, and open at its top end, with an internal peripheral bead as a seat for a plastic disc to be seated on the bead to cover the elements within the cell, and to receive the crimped end of the can for closure, and constructed to have a central co-axial bore and co-axial hub around the bore to hold a rivet to support an anode collector from the bottom side of the plastic disc and to support one of the terminals of the cell, here specifically the negative cap or terminal, from the top of the rivet, and to perform the additional function of closing the usual separator, with no intervening structure between it and the separator, to assure greater confining control of he electrolyte by said separator. The plastic disc top also constructed unitarily of full can diameter, and has an annular border disposed to provide a tight seating fit in the can at the bead as a seat, and is held in place by crimped edge rim of the can to assure a substantially hermetic seal between the disc border and the can. An external metal jacket surrounds and is insulated from the can, and serves as an additional element for impressing an additional pressure force on the metal crimped onto the plastic disc, to assure a hermetic seal under continuous pressure between those engaging surfaces of said disc border and of the crimped metal.

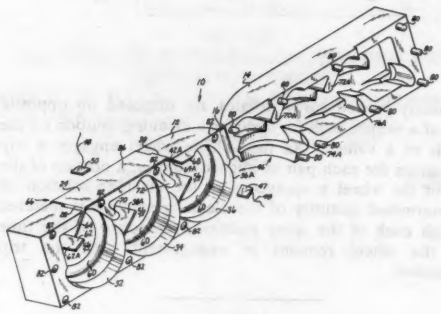
The anode collector is constructed of two hollow semicylindrical parts held to resist radial relative displacement, and to thereby maintain uniform ionic spacing between cathode and anode collector facing surfaces.

3,660,169

BATTERY PACKAGING DEVICE

Richard R. Clune, Ardsley, and Gordon E. Kaye, South Salem, both of N.Y., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Apr. 22, 1970, Ser. No. 30,744
Int. Cl. H01m *1/02*
U.S. Cl. 136—111 **12 Claims**



A two-part molded cartridge utilizes one part as an assembly tray or shell for assembling three electric cells in position to permit electrical interconnections between the cells, and to support contact terminal surfaces for connection to external circuit contact terminals, and then utilizes the second molded part as a cover, and the two parts are then sealed to constitute a housing for the cells as a battery unit.

3,660,170

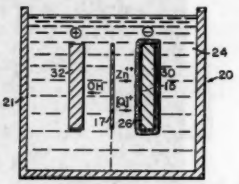
DENDRITE-INHIBITING ADDITIVE FOR BATTERY CELL HAVING ZINC ELECTRODE

Guy Rampel, Gainesville, Fla., assignor to General Electric Company

Filed Apr. 8, 1970, Ser. No. 26,607
Int. Cl. H01m *43/06*
U.S. Cl. 136—154 **12 Claims**

To inhibit the formation of overgrowth of excessive dendritic zinc, for example during recharging of a rechargeable electrolytic battery cell, or in electroplating, the electrolyte contains an additive consisting essentially of a cationic high molecular weight organic linear polymer which has a positive ion radical of substituted ammonium which may be one of a large number of related ammonium polymers, preferably quaternary. The quaternary nitrogen in the molecule can be part of a ring which may include the adjacent carbon atom for any two of the nitrogen's four substituent radicals, and the ring may also include ether link-

ages. The polymer compound is water soluble and is soluble in the electrolyte of the cell to the extent required to be effective for proper charge and discharge operation of the cell. The additive may be dissolved in the electrolyte directly, or



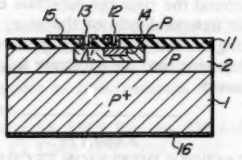
may be added as a coating on the separator film, or be an ingredient of the paste-type anode. A preferred embodiment of the invention comprises, as the additive, diallyldimethylammonium hydroxide polymer.

3,660,171

METHOD FOR PRODUCING SEMICONDUCTOR DEVICE UTILIZING ION IMPLANTATION

Takashi Tsuchimoto, Kodaira-shi; Takashi Tokuyama, Hoya-shi, and Kiichi Komatsubara, Tokorozawa-shi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 24, 1969, Ser. No. 887,936
Claims priority, application Japan, Dec. 27, 1968, 43/95458
Int. Cl. H01l 7/54
U.S. Cl. 148—1.5 **3 Claims**



A method for producing a transistor structure utilizing ion implantation, comprising the steps of implanting ions of base-forming impurity into a predetermined portion of a surface of a semiconductor body serving as a collector and heated to a temperature above 600° C. but below the melting point of the semiconductor to form a base region, and thereafter implanting ions of emitter-forming impurity into a predetermined portion of the surface of said base region heated to a temperature in the range of 400° to 600° C. to form an emitter region.

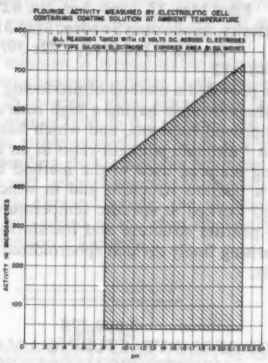
3,660,172

PREPAINT TREATMENT FOR ZINCIFEROUS SURFACES

George Freed Otto, Oreland, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Filed Aug. 19, 1970, Ser. No. 65,071
Int. Cl. C23f 7/26
U.S. Cl. 148—6.2 **3 Claims**

A conversion coating is applied to zinciferous surfaces, thereby enhancing the corrosion resistance and bonding properties of the substrate when a paint or similar siccative organic finish is thereafter applied.

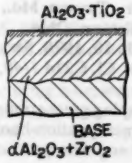

FLUORIDE ACTIVITY MEASURED BY ELECTROLYTIC CELL CONTAINING COATING SOLUTION AT AMBIENT TEMPERATURE
ALL READINGS TAKEN WITH 1.5 VOLTS DC ACROSS ELECTRODES
"F" TYPE SILICON ELECTRODE (EXPOSED AREA 0.04 SQUARE INCH)
ACTIVITY IN MICROAMPERES
pH

3,660,173

METHOD OF PREPARING CORROSION RESISTANT METALLIC ARTICLES

Akira Matsuno; Takao Sasame; Ikuzo Shimizu; Humio Kizu, and Hiroyuki Kagawa, all of Hiroshima-ken, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima-ken and Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed June 23, 1970, Ser. No. 49,052
Claims priority, application Japan, June 25, 1969, 44/50588
Int. Cl. C23f 7/04
U.S. Cl. 148—6.35 **6 Claims**



A method of furnishing the surface of ferroalloys with resistance to hot corrosive gases containing halogens or compounds thereof or to general oxidation which comprises the steps of heating in an oxidizing atmosphere at a temperature of 1,000° to 1,400° C for a suitable number of hours articles prepared from a metal consisting of 10 to 25 percent of chromium, 2 to 5 percent of aluminum, less than 0.04 percent of carbon, 0.005 to 0.05 percent of nitrogen, 0.1 to 0.6 percent of titanium, 0.01 to 0.5 percent of zirconium, iron as the remainder and further containing ordinary impurities, in which constitution ratio of Ti% + Zr% to N% ranges from 10 to 60, so as to diffuse by migration in the surface layer of the base body of the article part of oxidizable elements contained therein, thereby forming an oxide layer mainly consisting of αAl_2O_3 on said surface.

3,660,174

METHOD IN THE MANUFACTURE OF STAINLESS, HARDENABLE CHROMIUM-STEEL STRIP AND SHEET

Klas-Erik Jakenberg, Hagfors, Sweden, assignor to Uddeholms Aktiebolag, Hagfors, Sweden

Filed May 23, 1969, Ser. No. 827,355
Claims priority, application Sweden, May 31, 1968, 7333/68
Int. Cl. C21d 9/18; C22c 39/14
U.S. Cl. 148—12 6 Claims

There is provided a method of producing stainless, chromium-steel sheet or strip having a high resistance to corrosion and an improved hardness, and which has a relatively high yield point / ultimate strength ratio in an unhardened state, the starting material used in the method being one of substantially a pearlite structure and in which the material is heated and worked at specific temperatures so as to break down the pearlite structure and transform said structure to one comprising finely-divided spheroidized carbides in a ferritic matrix.

3,660,175

METHOD OF MANUFACTURING A MAGNETICALLY ANISOTROPIC MAGNET BODY

Theodorus Henricus Carolus Van Melis; Pieter Aart Naastepad, and Krijn Jacobus de Vos, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 11, 1970, Ser. No. 71,526
Claims priority, application Netherlands, Sept. 18, 1969, 6914126
Int. Cl. H01f 1/04
U.S. Cl. 148—103 4 Claims

A method of manufacturing anisotropic permanent magnets having a composition 28 – 42 percent Co, 10 – 20 percent Ni, 6 – 10 percent Al, 2 – 8 percent Cu, 4 – 10 percent Ti, remainder mainly Fe. The anisotropy is induced in the alloy, possibly together with the treatment in a magnetic field, by means of an elastic deformation of the alloy below the segregation temperature T_s. The result, at least when T_s is at least 25° C higher than T_c, is a higher energy product of the magnet than could be achieved so far.

3,660,176

PRECIPITATION-HARDENABLE STAINLESS STEEL METHOD AND PRODUCT

Elbert E. Denhard, Jr., Towson, Md., assignor to Armco Steel Corporation, Middletown, Ohio

Filed Feb. 10, 1970, Ser. No. 10,272
Int. Cl. C21d 1/40, 1/42
U.S. Cl. 148—142 5 Claims

Method for developing great strength, along with ductility, in the martensitic precipitation-hardenable stainless steels, particularly bar, rod and wire products, such as the 17-4 PH grade (about 17 percent chromium, 4 percent nickel, 3 percent copper, 0.07 percent max. carbon, and remainder iron), wherein the product, moving at significant speed, is subjected to high electrical energy heating to quickly take the hardening ingredients (copper, carbon, etc.) into solution; then quenched to transform the metal and preclude excessive grain growth, and finally reheated to effect hardening and strengthening.

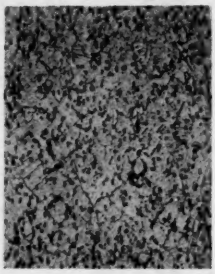
3,660,177

PROCESSING OF NICKEL-BASE ALLOYS FOR IMPROVED FATIGUE PROPERTIES

Edgar E. Brown, Glastonbury, and Raymond C. Boettner, Windsor, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed May 18, 1970, Ser. No. 38,227
Int. Cl. C22f 1/10
U.S. Cl. 148—11.5 R 11 Claims

The fatigue properties of the precipitation-hardened, nickel-base alloys, such as Inconel 718, Incoloy 901 and Waspaloy, are significantly improved by a thermomechanical processing technique involving the generation of an intermetallic pinning phase, such as a spheriodal eta phase or an overaged gamma prime phase, with subsequent recrystallization to provide a uniform microstructure having a grain size of ASTM 10–13 or finer.



3,660,178

METHOD OF DIFFUSING AN IMPURITY INTO A COMPOUND SEMICONDUCTOR SUBSTRATE

Susumu Takahashi, Kokubunji; Hisao Nakashima, Hachioji, and Masatoshi Migitaka, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 14, 1970, Ser. No. 63,846
Claims priority, application Japan, Aug. 18, 1969, 44/65205
Int. Cl. H01l 7/44
U.S. Cl. 148—189 8 Claims

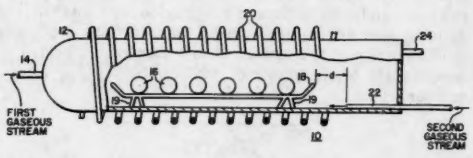
A semiconductor substrate of Group III–V compound such as GaAs or GaP covered uniformly with powder of the same kind of semiconductor with grain diameters of 20–500μ is placed in a quartz tube and a small piece of zinc is also placed in the tube at a place separated from the substrate, the zinc is heated above 700°C to evaporate it by a heating coil placed around the zinc, the substrate is also heated by a coil around it independently of the zinc, and a zinc gas is flowed by being carried by an argon gas over the heated substrate to diffuse zinc into the substrate from the vapor phase through the cover.

3,660,179

GASEOUS DIFFUSION TECHNIQUE

Timothy J. Desmond, Greensburg, and Berton P. Krumanacker, Connellsville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 17, 1970, Ser. No. 64,381
Int. Cl. H01l 7/44
U.S. Cl. 148—189 8 Claims



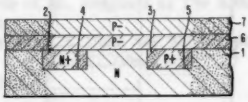
A counter-flow of an inert, or a predominantly inert, gas is provided in a diffusion furnace to provide means for creating turbulence within the diffusion system thereby improving the uniformity of dopant along the length of the diffusion carrier contained therein.

3,660,180

CONSTRAINMENT OF AUTODOPING IN EPITAXIAL DEPOSITION

Edward S. Wajda, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 27, 1969, Ser. No. 802,810
Int. Cl. H01l 7/36; C23c 11/00; H01l 5/00
U.S. Cl. 148—175 6 Claims



Autodoping is minimized during epitaxial deposition by sputtering a primary or initial film on a doped semiconductor substrate prior to epitaxial deposition.

3,660,181

BLASTING SLURRY COMPOSITIONS CONTAINING CALCIUM NITRATE AND METHOD OF PREPARATION

Robert B. Clay, Bountiful; Melvin A. Cook, and Lex L. Udy, both of Salt Lake City, all of Utah, assignors to Intermountain Research & Engineering Company, Inc.

Filed May 1, 1969, Ser. No. 821,095
Int. Cl. C06b 1/04, 19/00
U.S. Cl. 149—2 9 Claims

Slurry blasting compositions of low water content and high density, including substantial proportions of calcium nitrate as an oxidizer component, can be sensitized in various ways to produce economical explosive compositions. Sensitizers may include aluminum powder, granular explosives such as smokeless powder, TNT, etc.; a particularly preferred sensitizer or fuel is ethylene glycol. Solid carbonaceous fuels and conventional thickeners may be added. The calcium nitrate may be produced directly from burned lime with nitric acid and/or other nitrates.

3,660,182

EXPLOSIVE COMPOSITIONS AND METHOD OF PREPARATION

Melvin A. Cook, and Frederick K. Balli, both of Salt Lake City, Utah, assignors to Intermountain Research and Engineering Co., Inc.

Filed Aug. 15, 1969, Ser. No. 850,648
Int. Cl. C06b 1/04, 7/00, 21/00
U.S. Cl. 149—46 12 Claims

An explosive composition in slurry or semi-solid form and containing calcium nitrate is made up by reacting calcium oxide with formaldehyde, preferably in the form of paraformaldehyde, in the presence of ammonium nitrate. The water generated in the reaction serves as a vehicle for the slurry. A thickener of gum or preferably starch is added, and gassing agents may be incorporated to control or reduce composition density. The presence of ammonium nitrate prevents runaway reactions and the hexamethylene-tetramine which is produced in the reaction serves as a fuel tending to give oxygen balance to the composition.

3,660,183

STABLE SUSPENSIONS

Edwin C. Knowles, Poughkeepsie; Frederic C. McCoy, Beacon, and Norman R. Odell, Wappingers Falls, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 39,426, June 29, 1960. This application Dec. 27, 1961, Ser. No. 162,549
Int. Cl. C06d 5/10
U.S. Cl. 149—21 16 Claims

Stable suspensions useful as high energy propellant and agricultural compositions comprising a finely-divided vehicle-insoluble organic or inorganic powder, 0.2 to 3.0 percent vehicle-insoluble microfibers and a liquid vehicle which is either a liquid hydrocarbon or a hydrocarbon soluble polar hydrocarbon derivative such as an amine, amide, ketone, alcohol, etc. The microfibers are either inorganic microfibers having an average particle between 0.01 and 2.0 microns or organic microfibers having an average fiber diameter between 1 and 20 microns. A typical stable suspension comprises 68.72 percent aluminum powder, 1.43 percent diethyl stearyl amide, 0.75 percent glass microfibers having an average fiber diameter of 0.05 to 0.2 microns and 29.1 percent kerosene. This stable suspension useful as a propellant was prepared by blending glass microfibers into the kerosene fraction to form a soft gel and separately blending the aluminum powder with distearyl amide; the aluminum-amide mixture is then slowly added to the glass fiber-kerosene gel until a buttery suspension is formed.

3,660,184

PROCESS FOR MANUFACTURING TIGHT SEALS, AND SEALS OBTAINED BY THIS PROCESS

Pierre Burelle, Le Vesinet, and Jean Alfred Engelhardt, Lyon, both of France, assignors to Societe anonyme dite Cefilac, Paris, France

Continuation-in-part of application Ser. No. 565,754, July 18, 1966, now abandoned. This application May 18, 1970, Ser. No. 38,521
Claims priority, application France, July 29, 1965, 26541
Int. Cl. B29j 5/02
U.S. Cl. 156—62.2 16 Claims

Method of forming gaskets by projecting a layer comprising 70–90% of a fibrous material and 10–30% of a settable binder onto a supporting sheet, causing the binder to set, and there compressing the layer. An adhesive may be used to secure the layer to the sheet, or the sheet may be treated to prevent adhesion of the layer and removed after the compression step.

3,660,185

METHOD OF PRODUCING A HAIRPIECE

David C. Bonham, 1227 Wilmington Avenue, Salt Lake City, Utah

Filed Oct. 25, 1968, Ser. No. 770,767
Int. Cl. B32b 5/00
U.S. Cl. 156—72 8 Claims

A method of manufacturing hairpieces which allows them to be rapidly produced but provides a product that is durable, easy to care for and natural in appearance. Hairs are temporarily positioned with a holding means, a base material is positioned around the hairs to permanently secure them in place and the holding means for temporarily positioning the hairs is removed.

3,660,186

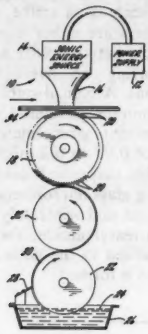
METHOD FOR BONDING WEBS EMPLOYING ULTRASONIC ENERGY

Karl E. Sager, Appleton, and Howard N. Nelson, Neenah, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 8, 1969, Ser. No. 814,383
Int. Cl. B32b 31/16
U.S. Cl. 156—73 9 Claims

A continuous method for bonding or seaming running webs wherein a moving arcuate surface serves as an anvil against which a sonic horn can work while at the same time supplying a bonding medium to the webs as they pass under

the horn, and to apparatus for carrying out such a method. In



one embodiment, the arcuate surface is designed to provide a seam which simulates a series of stitches.

3,660,187

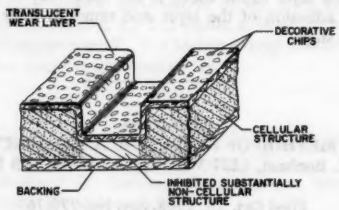
WEAR RESISTANT, TEXTURED RESINOUS COMPOSITIONS

Harry A. Shortway, Glen Rock; Alan A. Graham, Mercerville; Robert D. Mansolillo, Bloomfield, all of N.J., and Joseph F. Dobry, Langhorne Manor, Pa., assignors to Congoleum Industries, Inc., Kearney, N.J.

Filed Mar. 14, 1969, Ser. No. 807,269

Int. Cl. B32b *5/18*

U.S. Cl. 156—79 **20 Claims**



Wear resistant resinous compositions having textured or embossed surfaces resulting from the process which comprises selectively contacting a resinous polymer containing a blowing agent dispersed therein with an inhibitor for said agent, applying thereto a self-supporting layer of a translucent, decorative, resinous wear layer, and, thereafter heating the resulting assembly so as to effect the decomposition of the blowing agent and the resultant expansion on the surface of the resinous composition as well as to fuse the wear layer which has conformed to the surface embossings.

3,660,188

A METHOD OF RECYCLING AND RECONDITIONING A METAL SHIPPING CONTAINER

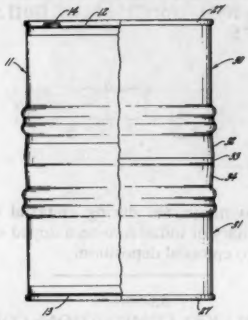
Oscar J. Van Leer, North Holland, Netherlands, assignor to Inland Steel Company, Chicago, Ill.

Continuation-in-part of application Ser. No. 648,647, June 26, 1967, now abandoned. This application Oct. 24, 1969, Ser. No. 869,245

Int. Cl. B32b *35/00*

U.S. Cl. 156—94 **6 Claims**

A method of recycling a drum shaped metal shipping container which has at least two parts in overlapping relationship, the overlapping portions of said parts being secured together in liquid tight relation by an adhesive substance which when subjected to heat or an appropriate dissolving agent disintegrates so that said parts may be disassembled to



make the container interior fully accessible for reconditioning. The adhesive substance is disintegrable and completely removable from the container parts without deforming the container parts or affecting the metallurgical properties of the parts.

3,660,189

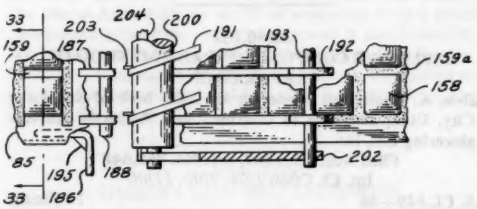
CLOSED CELL STRUCTURE AND METHODS AND APPARATUS FOR ITS MANUFACTURE

Constantine T. Troy, 1330 Cleveland Avenue, Wyomissing, Pa.

Filed Apr. 28, 1969, Ser. No. 819,719

Int. Cl. B32b *31/02, 31/00*

U.S. Cl. 156—145 **6 Claims**



Cellular cushioning material is prepared by sealing an elastic substance within cells that are formed between two flexible films. When the elastic material is a gas, means may be provided to charge the cells at superatmospheric pressure to achieve full inflation of the cells and maximum efficiency of the cushioning material.

3,660,190

PROCESS FOR THE MANUFACTURE OF A COMPOSITE MATERIAL HAVING A METAL LAYER

Joachim Stroszynski, Wiesbaden, Germany, assignor to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

Filed Dec. 27, 1968, Ser. No. 787,438

Claims priority, application Germany, Dec. 30, 1967, P 17 04 785.7

Int. Cl. C23b *5/00*

U.S. Cl. 156—150 **6 Claims**

This invention relates to a process for the manufacture of a composite material including a supporting film or foil and a metal layer bonded thereto, which comprises depositing the metal layer on an intermediate support having an endless

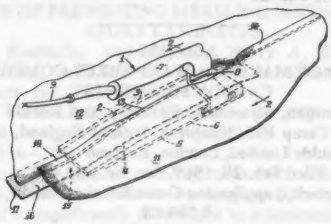
rotatable surface, pressing the supporting film or foil onto the metal layer while an adhesive layer is interposed between them and while the film or foil is supported by a cylindrical conveyor roller, and removing the bonded composite material from the surface of the latter roller.

3,660,191

METHOD OF CARPET SEAMING

Robert E. Shimota, Fox River Grove, and Harry J. Dritt, Wheaton, both of Ill., assignors to The Kendall Company, Boston, Mass.

Filed Dec. 8, 1969, Ser. No. 882,985
Int. Cl. D06h *5/00*
U.S. Cl. 156—152 14 Claims



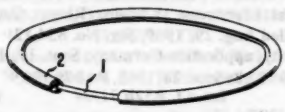
Adjacent sections of carpeting are joined in a seam between abutting edges of the carpet sections by a strip of heat activatable adhesive tape applied to the back sides of the carpet sections with the carpet sections lying face-up on a surface while heating the tape from its non-adhesive back side.

3,660,192

METHOD OF MAKING SEALING RING WITH RESILIENT CORE

Robert D. Smith, Wilmington, and Ronald L. Herron, Newark, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed June 19, 1968, Ser. No. 738,214
Int. Cl. B65d *53/02*
U.S. Cl. 156—155 8 Claims



The invention deals with a method of making endless sealing ring members by forming a sleeve element of a solid high molecular weight copolymer of hexafluoropropylene and tetrafluoroethylene into a loop. The ends are butt-welded to form a smooth toroidal ring. A hole is punched in the side through which entrapped fluid is removed and a liquid silicone rubber composition is injected to form a core. The point of injection is sealed and the core material is solidified.

3,660,193

A–I POLYMER LAMINATES PREPARED BY FILAMENT WINDING

Benjamin A. Bolton, Winfield, Ill., assignor to Standard Oil Company, Chicago, Ill.

Continuation-in-part of application Ser. No. 748,954, July 31, 1968, now abandoned. This application Mar. 5, 1971, Ser. No. 121,522
Int. Cl. B65h *81/00*
U.S. Cl. 156—169 13 Claims

A continuous process for preparing a heat resistant polymer laminate, said process comprising: (1) coating glass fibers with a solution comprising an uncured aromatic polytrimellitamide polymer, having imide forming groups, dissolved in a suitable solvent, (2) flashing off a limited amount of solvent at a temperature below the curing temperature of said uncured aromatic polytrimellitamide polymer, leaving said polymer uniformly deposited on the surface of said fibers, (3) winding said fibers on a mandrel, and (4) curing the polymer leaving essentially no unconverted imide forming groups, thus preparing said polymer laminates.

3,660,194

METHOD OF FABRICATING FLUID-TIGHT CONTAINERS

Arthur W. Hoffmann, Hunibach; Pierre Locuty, and Walter Buhlmann, both of Thun, all of Switzerland, assignors to Gebr. Hoffman AG, Thun, Switzerland

Continuation-in-part of application Ser. No. 708,070, Feb. 26, 1968, now abandoned. This application Dec. 21, 1970, Ser. No. 100,196
Claims priority, application Sweden, Feb. 24, 1967, 2784/67
Int. Cl. B65h *81/00*
U.S. Cl. 156—191 14 Claims

There is disclosed a method of producing gas-tight and liquid-tight containers, especially collapsible tubes wherein a strip of plastic coated carrier foil is bent or wound into the shape of a substantially cylindrical tube, the longitudinal edges of the strip being arranged in overlapping relationship. These longitudinal edges are then heat-sealed and the tube is coated with a sheath of plastic for covering the overlapping seams and providing a smooth continuous outer surface capable of receiving an imprint. Further, according to the invention the amount of plastic material and application thereof to the surface of the tube is controlled such that the outside surface of such tube when covered with the plastic sheathing possesses a shape and dimension substantially corresponding to the internal receiving wall of a mold cavity for heading the tube. The tube, typically after having been cut into finite tube sections, is then inserted at one end into a mold cavity, the outside surface of such tube section snugly fitting in good sealing relationship against the internal receiving wall of the mold cavity. The inner wall of the tube section, at least at the end region thereof received in the mold cavity is freely exposed, so that when moldable material is introduced into the mold cavity it contacts such exposed inner wall, thereby producing a substantially radially directed force applied outwardly against the inner exposed wall of the tube, urging the outer wall thereof into extreme sealing contact with the internal receiving wall of the mold cavity so that an extremely effective seal appears at the location where the tube section has been inserted into the molding cavity.

3,660,195

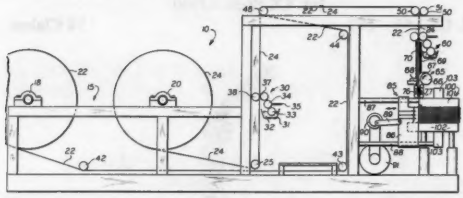
METHOD AND APPARATUS FOR FORMING CELLULAR CORES

Edwin R. Hoyt, Coral Gables, Fla., assignor to Core Cell Corporation, Bayamon, P.R.

Filed June 2, 1969, Ser. No. 829,167
Int. Cl. B31d *3/02*
U.S. Cl. 156—197 16 Claims

A method and apparatus for forming cellular cores from sheet stock of paper, metal or plastic for use in the subsequent formation of laminated cellular panels, or for use in-

dependently to provide sound and thermal insulation. The process comprises the steps of feeding two or more webs of sheet material to be formed into the core; joining the webs by applying spaced lines of adhesive or the like between the webs along their direction of feed, bringing the webs into contact so as to cause them to join along said first applied lines of adhesive; applying spaced lines of adhesive or the like, spaced to lie between the previously applied adhesive lines on an outer face of the joined webs; simultaneously cutting a group-strip equal in length as measured along the web to the thickness of two or more layers of the final core product from the adhered webs transverse to their direction of movement; and packing and simultaneously cutting said group-strip into two or more strips by moving them transverse to the direction of web feed to simultaneously form a plurality of layers of cellular cores of selected thickness. Apparatus suitable for performing the method is provided comprising supports for two or more supply rolls of web sheet



material; means for feeding the sheet material from the supply rolls; sheet joining means such as adhesive applicators and laminating rolls arranged in the path of web feed for applying spaced lines of adhesive between the web surfaces; a final adhesive applicator for providing adhesive on the outer surface of one of said webs; pressure applying means for bringing two or more of the adhesive stripped web surfaces into contact to bond same along the first lines of adhesive application; cutting means for cutting group-strips equal in length as measured in the direction of web feed to the thickness of two or more layers of the cellular core product from the advancing web transverse to the direction of movement; and packing-cutting means for simultaneously packing the group-strips against the strips of previously cut group-strips and cutting the group-strips into a plurality of separate strips equal in length as measured along the web to the thickness of the cellular core product, said packing means packing two or more tiers of strips simultaneously.

3,660,196

METHOD OF APPLYING TRANSFERS TO FIBER GLASS ARTICLES

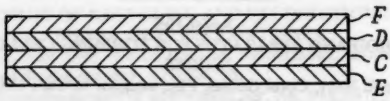
Robert A. Keeling, and John G. Priest, both of London, England, assignors to Johnson, Matthey & Co. Limited, London, England

Continuation of application Ser. No. 665,319, Sept. 5, 1967. This application June 23, 1969, Ser. No. 840,124

Claims priority, application Great Britain, Sept. 5, 1966, 39,594/66

Int. Cl. B44c *3/02*; B32b *31/12*; B44d *1/14*

U.S. Cl. 156—235 **11 Claims**



There is provided a method of applying transfers or decalcomanias to a tacky surface particularly the surface of a partially cured fiber glass article. The transfer decalcomania includes a backing sheet, a first intermediate layer applied to the backing sheet and a design layer, with or without a second intermediate layer interposed between the first intermediate layer and the design layer. Where a second intermediate layer is not included, the first intermediate layer is such that the adhesion between it and the design layer is less than the adhesion between the first intermediate layer and the backing sheet and between the design layer and a tacky surface. Where a second intermediate layer is included, the adhesion between the said first and second layers is less than the adhesion respectively between the first intermediate layer and the backing sheet, the second intermediate layer and the design layer and the design layer and a tacky surface. The transfer may be applied to an initial resin coat applied to the inside of a mould after which the fiber glass article is completed by additional layers of fiber glass and resin whereby the design is embedded in the article and can be seen from the outside.

3,660,197

METHOD OF MAKING A WARP SHEET COMPRISING CARBON FILAMENTS

Peter E. Morgan, Styvechale, Coventry, and Ronald William Roberts, Camp Hill, Nuneaton, both of England, assignors to Courtaulds Limited, London, England

Filed Feb. 28, 1969, Ser. No. 803,451

Claims priority, application Great Britain, Feb. 29, 1968, 9,789/68

Int. Cl. B32b *31/00*

U.S. Cl. 156—280 **9 Claims**

A process for the production of a warp sheet which comprises preparing a sheet of an inert material and coating that sheet with a polymeric material which can be rendered tacky, causing a number of oriented carbon filaments to adhere to the tacky coating, covering the exposed surface of the carbon filaments with polymeric material, and treating the polymeric material to reduce the degree of tack. Thin warp sheets may be prepared by applying a relatively thick layer of carbon filaments and removing those which do not adhere while thicker sheets are made by spreading the requisite quantity of carbon filaments uniformly over the surface.

3,660,198

METHOD OF MAKING DOUBLE WALLED PLASTIC ARTICLES

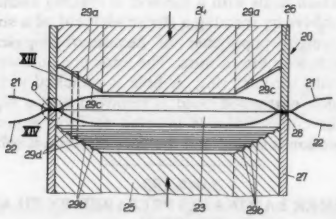
Alfons W. Thiel, Uferstrasse 15, Mainz (Rhine), Germany

Filed Aug. 29, 1969, Ser. No. 854,129

Claims priority, application Germany, Sept. 17, 1968, P 17 79 723.8; Sept. 26, 1968, P 17 79 790.9

Int. Cl. B32b *31/04*

U.S. Cl. 156—292 **19 Claims**



Double walled plastic articles chiefly receptacles comprise jacket and lining members of relatively thin thermoplastic sheet material such as foils connected firmly around outer peripheral portions and relatively shaped to provide on the article an outer annular peripheral wall section containing an insulating air space region between the members. The jacket and lining are formed with ribs and/or the like which cross and are firmly surface bonded to each other under heat and pressure within air space region at a plurality of spaced substantially flat areas. The jacket and lining may be stepped.

Special methods and apparatus are provided for producing the articles including connecting and shaping tools for forming bonded double layer regions surrounding air cushion areas that function in the process to insure proper forming of the jacket and lining as the tool dies come together. The die faces also include projections for imparting an added mechanical interlock at the bonded areas. The articles may be continuously produced starting with two separate heated foil webs, which may be differently responsive to heat or otherwise different, or starting with continuously extruded thermoplastic tubing. In the latter case the heat attendant to the extrusion operation may be sufficient for the bonding operation so that no added heat is necessary.

3,660,199

METHOD OF PREVENTING MEASLING WHEN MAKING EPOXY LAMINATES

Michael Riccitiello, Amherst, and Harry A. Kreitmayer, Tonawanda, both of N.Y., assignors to Spaulding Fibre Company, Inc., Tonawanda, N.Y.

Filed July 24, 1969, Ser. No. 844,277
Int. Cl. C09j *5/00*
U.S. Cl. 156—306 **9 Claims**

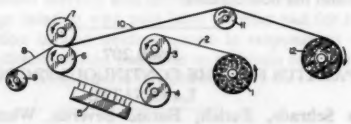
Measling, the appearance of spots or stars under the surface of a resin portion of an epoxy-glass fiber laminate, is prevented or significantly diminished by a laminating process which includes curing plies of glass cloth and epoxy resin at an elevated temperature, e.g., 300° to 400° F., at an elevated pressure, e.g., 750 to 1,500 pounds per square inch, until gel formation occurs by reaction of the epoxy resin and curing agent, after which heating is continued at approximately the same temperature but at a lower pressure, e.g., 50 to 400 lbs./sq. in. Suitably, the initial curing step lasts for about 30 to 80 minutes and the subsequent step takes about 20 to 50 minutes, such times varying with the thickness of the laminate, the nature of the expoxy resin, the temperature employed, the geometry of the laminate, the type of reinforcing cloth, the curing apparatus used and the presence or absence of metal molded into the plastic. After completion of heating, the laminate is cooled in the press and is then removed.

3,660,200

PROCESS FOR BONDING PREHEATED THERMOPLASTIC FILM TO A DISSIMILAR SUBSTRATE

Robert E. Anderson, 108 LaSalle Drive, Richmond, Va., and Augustus W. Bachman, Jr., Williamburg Court, Williamsburg, N.Y.

Continuation of application Ser. No. 572,260, Aug. 15, 1966, now abandoned. This application July 9, 1969, Ser. No. 845,650
Int. Cl. C09j *5/06*
U.S. Cl. 156—306 **11 Claims**



The present process relates to a method and an apparatus for continuously thermally bonding layers of materials together so as to form a laminate from a composite which includes at least one layer of thermoplastic film and at least one layer of substrate. In particular, the present invention is of value for bonding together multiple layers of thermoplastic film and substrate to which have been imparted various decorative and utilitarian effects.

3,660,201

PROCESS FOR PRODUCING A DECORATIVE LAMINATED PLASTIC STRUCTURE CONTAINING IN AT LEAST ONE LAYER THEREOF FROM ABOUT 4 TO ABOUT 100 PARTS PER MILLION OF A LITHIUM COMPOUND

Alwyn Senior, Greenhills, and George Edward Power, Wyoming, both of Ohio, assignors to Formica Corporation, Cincinnati, Ohio

Continuation-in-part of application Ser. No. 572,668, Aug. 16, 1966, now abandoned. This application Dec. 2, 1969, Ser. No. 881,605
Int. Cl. C09j *5/00*
U.S. Cl. 156—309 **7 Claims**

This invention relates to the process for producing a decorative laminated plastic structure in which the thermosetting resin used to impregnate at least one of the fibrous layers of said structure contains a quantity of a lithium compound sufficient to provide from about 4 to about 100 parts per million of said lithium compound in said laminated plastic structure.

3,660,202

BONDING OF SHAPED ARTICLES OF POLYESTER

Robert Alexander Edington, and Derek Harry Aldred, both of Harrogate, England, assignors to Imperial Chemical Industries, Limited, London, England

Continuation-in-part of application Ser. No. 585,243, Oct. 10, 1966, now abandoned. This application Apr. 25, 1969, Ser. No. 819,423
Claims priority, application Great Britain, Oct. 18, 1965, 43,983/65
Int. Cl. C09j *3/12*
U.S. Cl. 156—335 **7 Claims**

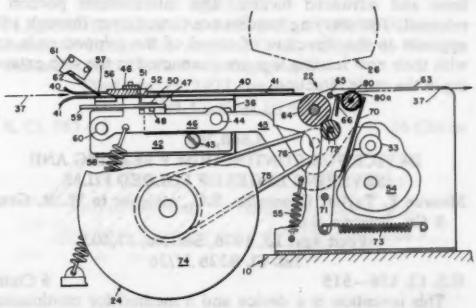
An improved process is described for bonding polyester shaped articles to rubber. The improvement comprises treating the polyester surface with an aqueous solution of a bis(dihydroxyphenyl methyl)phenol which results in an increased bond strength using conventional aqueous rubber latex and resorcinol formaldehyde condensate dips to bond the polyester to the rubber. The surface treatment may be effected in a separate prior process followed by a conventional bonding process using a rubber latex and a resorcinol formaldehyde condensate, or it may be effected in a single bath process together with a rubber latex and a resorcinol formaldehyde condensate.

3,660,203

TAPE PRINTING AND HANDLING SYSTEM

Christian A. Beck, Ridgefield, and Harry E. Luperti, Wilton, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Nov. 19, 1968, Ser. No. 777,015
Int. Cl. B65c *11/02*
U.S. Cl. 156—384 **1 Claim**



A tape handling system for a label type printing machine wherein the tape includes a backing strip on which is carried

an upper releasable pressure sensitive print receiving strip. The composite tape is perforated at regular intervals along its length so as to facilitate printing positionment of the tape, after which the printed tape portion may be transversely torn off along said perforations. The tape handling apparatus includes a detent for engaging said perforations, a separator for facilitating the stripping of the backing strip from the releasable strip, and a yieldably driven take-up spool for the backing strip.

3,660,204

APPARATUS FOR APPLYING CARRYING HANDLES OF PAPER OR PLASTICS MATERIAL TO A WEB

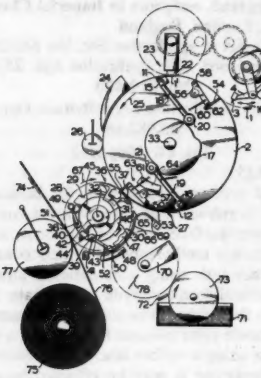
Heinz Wesselmann, Brochterbeck, and Friedhelm Brinkmeier, Ladbergen, both of Germany, assignors to Windmoller & Holscher, Lengerich, Westphalia, Germany

Filed July 17, 1969, Ser. No. 842,633

Claims priority, application Germany, July 17, 1968, P 17 69 880.3

Int. Cl. B31b *1/86*

U.S. Cl. 156—443 **10 Claims**



U-shaped carrying handles have been made from elongated strips of paper or plastics material in that both end portions have been folded through 90°. The handles are applied to a web intended to make carrying handles in such a manner that the end portions of the strip lead in the direction of travel of the web. The strip is first gripped in known manner in its intermediate portion. The strip end portions are folded through 90° opposite to the direction of travel of the strip. The resulting legs of the carrying handle are gripped at their end portions and advanced further. The intermediate portion is released. The carrying handles are turned over through 180° opposite to the direction of travel of the gripped ends and with their now leading legs are connected to the web extending in the same direction.

3,660,205

DEVICE FOR CONTINUOUSLY SEALING AND SEVERING EDGES OF FOLDED FILM

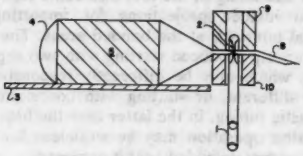
Monroe F. Taylor, Greenville, S.C., assignor to W. R. Grace & Co., Duncan, S.C.

Filed Apr. 13, 1970, Ser. No. 27,503

Int. Cl. B32b *31/26*

U.S. Cl. 156—515 **6 Claims**

This invention is a device and a method for continuously sealing and severing two superimposed layers of heat-sealable film while controlling the cooling of the sealed and severed edge to cause strengthening of the seal and reduction of wrinkles in the film adjacent the seal. A preferred device is an inverted U-shaped electrically heated blade partially enclosed by a pair of cooling bars disposed so that the superimposed layers of sealable film pass therebetween in prolonged contact with the heated blade.



3,660,206

MACHINE FOR ASSEMBLING LAMINA WORKPIECES

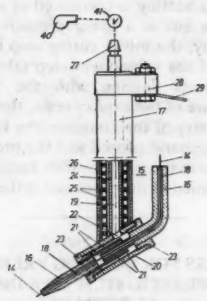
Gerhard Ortel, Rietberg, Germany, assignor to Heinrich Kuper, Rietberg, Westfalen, Germany

Filed Sept. 11, 1969, Ser. No. 857,081

Claims priority, application Austria, Sept. 13, 1968, A 8926/68

Int. Cl. B32b *31/10, 31/20*

U.S. Cl. 156—545 **8 Claims**



A machine for assembling lamina workpieces has a workpiece table and at least one pressure roller located over the table for pressing an adhesively coated thread in position on the workpiece surfaces. The thread being located by means of a guide device comprising a guide tube and a heating tube, the guide passage of the guide tube receiving the thread communicates with a hot air passage of a heating tube adapted to heat air passing under pressure therethrough into the guide passage via passages defined by edge regions of the guide tube and the heating tube.

3,660,207

APPARATUS FOR THE CONTINUOUS PRODUCTION OF LAMINATES

Jean Schrade, Zurich; Harald Severus, Winterthur, and Walter Muller, Meilen, all of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Sept. 4, 1970, Ser. No. 69,820

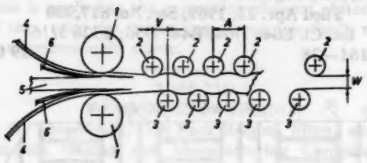
Claims priority, application Switzerland, Sept. 9, 1969, 13602/69

Int. Cl. B31f *5/00;* **B02c** *11/08*

U.S. Cl. 156—555 **12 Claims**

An apparatus for use in the continuous production of composite plates having a core layer of plastic and cover layers. There is used a plurality of first rollers for receiving and

discharging the layers, having a space between them equal or larger than the thickness of the laminates prior to rolling and



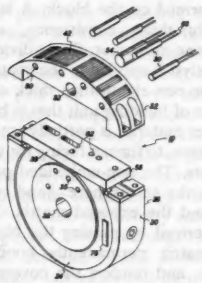
a series of second parallel successive rollers downstream of the first rollers and being at varying planes parallel to the direction of movement.

3,660,208

THERMOSTATIC HEAT WHEEL

Leo J. Hubbard, Dayton, Ohio, assignor to Xerox Corporation, Rochester, N.Y.

Filed Dec. 29, 1969, Ser. No. 888,702
Int. Cl. B65c *9/22, 9/28*
U.S. Cl. 156—571 **4 Claims**



A heat transfer wheel including a label transfer pad to carry address-bearing labels from a label pick-up station to the point of application where the addresses are transferred to an article through the use of heat, heating means in said label transfer pad, said transfer pad being thermally insulated from the rest of the wheel to facilitate heat retention and distribution; vacuum passage means leading to the label bearing surface of the label transfer pad to enable labels to be temporarily attached thereto; and thermostatic control means in heat exchange relation with said label transfer pad for regulating operation of said heating means in response to temperature conditions of said pad so as to maintain said transfer pad at a uniform temperature condition.

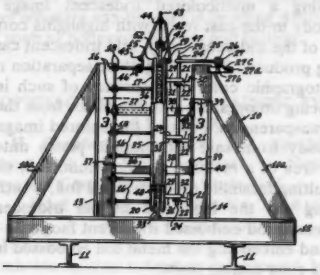
3,660,209

LAMINATION PRESS EMPLOYING ECCENTRICALLY ACTUATED ROCK SHAFTS FOR MOVING ITS PLATEN

Billy L. Woods, 3818 West Ocotillo, Phoenix, Ariz.

Filed Aug. 4, 1969, Ser. No. 847,245
Int. Cl. B30b *7/04;* **B32b** *31/20*
U.S. Cl. 156—580 **1 Claim**

A laminating press for accurately forming laminated panels for building construction comprising a thick foam plastic sandwiched between masonite side panels covered with fiberglass on their outside surfaces, the press being operable to load the materials, accurately position and support the



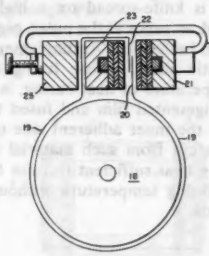
side panels and fiberglass sheets in precise position during the forming operations.

3,660,210

STATIC AUTOGENOUS SEALING BAR

Harry Samuel Chapman, R.D. 3, P.O. Box 224A, Hickory Hill, Pa.

Filed May 13, 1969, Ser. No. 824,211
Int. Cl. B30b *15/34*
U.S. Cl. 156—583 **8 Claims**



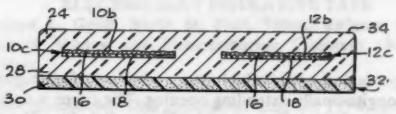
A static sealer bar is provided for heat-sealing organic polymeric materials, especially fluorocarbon films; the static sealer bar is characterized by a base member of, for example, asbestos material having a heating element disposed in a slot or recess extending substantially the entire length of one face of the base member; the slotted surface of the base member is covered by a layer of polyimide film which is, in turn, covered by a layer of silicone rubber film, and the silicone rubber film is preferably covered by a layer of polyimide. A method for heat-sealing fluorocarbon films in situ on large diameter rolls utilizing the static sealer bar also is provided.

3,660,211

PLASTIC ARTICLE AND METHOD OF PRODUCTION

Norman M. Brody, Los Angeles, Calif., assignor to Norman Industries, Inc., Santa Fe Springs, Calif.

Filed Jan. 15, 1971, Ser. No. 106,706
Int. Cl. B44f *1/14*
U.S. Cl. 161—2 **16 Claims**



Production of a decorative iridescent cast plastic article comprising a clear cast resin, e.g., polyester, body having em-

bedded therein an embossed multicolored iridescent facsimile on a metal, e.g., aluminum, foil of a multicolored iridescent body, e.g., an abalone shell, the embossed facsimile forming a multicolored iridescent image of the iridescent body in the cast resin, with highlights corresponding to those of the iridescent body, said iridescent cast plastic article being produced by forming color separation negatives from a photographic color transparency of such iridescent body, producing lithographic printing plates from the respective color transparencies, printing the colored image of such iridescent body from said lithographic plates onto a predetermined area of a metal, e.g., aluminum, foil, embossing into the resulting facsimile on such metal foil, a surface contour bringing out the highlights of the iridescent body, cutting the metal foil embossed iridescent facsimile from the metal foil, and embedding the metal foil embossed iridescent facsimile in a clear casting resin.

3,660,212

PLASTIC ATHLETIC LETTERING MATERIAL AND PROCESS FOR MANUFACTURING SAME

Robert James Liebe, Jr., 7 Middlebrook, Creve Coeur, Mo.

Filed July 17, 1969, Ser. No. 842,476

Int. Cl. B32b *7/06, 27/10, 27/30*

U.S. Cl. 161—41 **3 Claims**

Flexible plastic sheet material is provided from which pigmented letters, designs and the like may be cut for fusing to fabrics. A liquid pigmented mass of heat curable plastic, for example, plastisol, is knife-spread on a high gloss release sheet and heat cured, to serve as the outer, pigmented side of the sheet material to be formed. An unpigmented preformed flexible thermoplastic sheet, whose fusing temperature is lower than the temperature of heat curing, is pressed to the newly cured, hot pigmented film and fused to it; this thermoplastic serves as the inner adherent side of the material. Letters and designs cut from such material may be ironed onto fabric, utilizing heat sufficient to raise the inner, thermoplastic side to fusing temperature without affecting the outer, pigmented side.

3,660,213

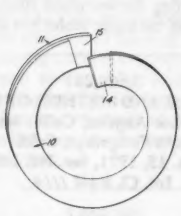
CORRUGATED COVERS

Royston L. Moseley, Bewdley, England, assignor to Henry Beakbone (Fortox) Limited, Kidderminster, England

Filed Feb. 2, 1970, Ser. No. 7,518

Int. Cl. F16d *3/84*

U.S. Cl. 161—7 **7 Claims**



A corrugated cover which has a number of corrugations and a longitudinally extending opening. The cover is made up from pairs of rings formed with offset radial slits. The rings are connected in pairs to form annuli and the annuli are connected together by sewing around their inner and outer peripheries alternately.

3,660,214

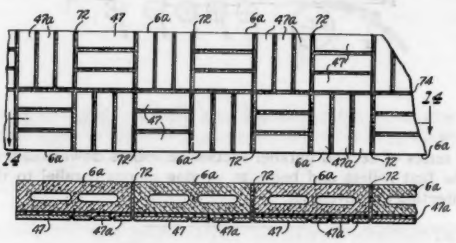
CONCRETE BLOCK OR THE LIKE WITH MULTIPLE BRICK FACING AND METHOD OF MAKING THE SAME

Charles E. Nichols, Jr., North Augusta, S.C., and Gerald T. Howard, Gracewood, Ga., assignors to Merry Companies Incorporated, Augusta, Ga.

Filed Apr. 21, 1969, Ser. No. 817,980

Int. Cl. E04c *1/04;* **B44f** *7/00;* **B32b** *5/16*

U.S. Cl. 161—38 **29 Claims**



A method and resulting structural building unit wherein a conventional masonry cement block, for example, has a portion removed, if necessary, to give it a predetermined vertical height. The presized block is placed upon a continuously moving conveyer and one side of the block is preheated and then coated with a liquid material comprising a polyester resin, a styrene monomer, a solvent, and a catalyst. The stored heat in the block quickly evaporates the solvent and polymerizes the resin and monomer so that a strongly adhering bonding coat is formed on the block. A layer of matrix material of relatively thick consistency, comprising a polyester resin, a styrene monomer, finely divided silica, colloidal silica, and a catalyst is applied to the coated block. The layer of matrix may be one-eighth inch thick or thicker, depending upon the type of building unit that is being made. A facing of brick or other material is partially embedded in the matrix, in spaced relation, to form a facing for the block with simulated mortar joints. The non-embedded portions of the facing are exposed to the atmosphere. Sand is sprinkled on the facing material and the exposed matrix. The matrix is then cured or polymerized by passing the block through a curing oven. The matrix permanently bonds the facing material to the block, and renders the covered side of the block impervious to moisture. The sand adheres to the matrix, but is readily removable from the facing materials.

3,660,215

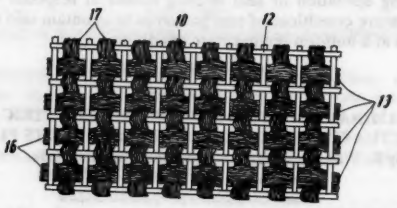
DEFORMABLE FIBREGLASS REINFORCED SUPPORTING ELEMENT

Heinrich R. Pawlicki, Faha West Adrigole, Bantry, Co. Cork, Ireland

Continuation of application Ser. No. 740,923, June 6, 1968, now abandoned. This application Dec. 14, 1970, Ser. No. 98,206

Int. Cl. B32b *5/12*

U.S. Cl. 161—57 **3 Claims**



A supporting element comprising a first layer of a flexible grid-like structure, defining the shape of the supporting ele-

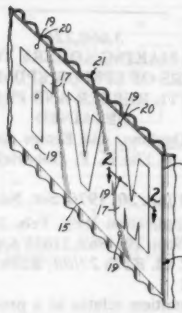
ment and a second layer of a fibreglass mat, interwoven with or bonded to the first layer. One or several additional layers formed either by a grid-like structure similar to the first layer or by one or several fibreglass mats may be bonded to the first and second layers. The supporting element may be deformed into any desired configuration. Subsequently molding resin is applied to the supporting element. After hardening of the resin, the supporting element is fairly rigid and remains dimensionally stable.

3,660,216

SEMI-RIGID PANELING

Jerald W. Theodorson, Oak Park Heights, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Aug. 20, 1969, Ser. No. 851,653
Int. Cl. B32b *3/26, 5/18, 27/40*
U.S. Cl. 161—161 **14 Claims**



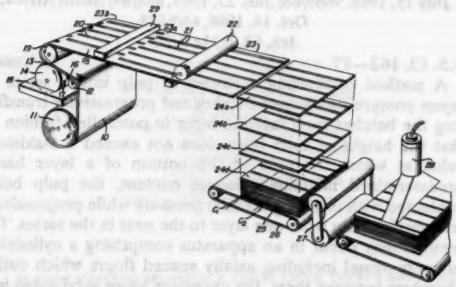
A laminate preferably consisting of a 25–250 mil-thick sandwich having a microsphere-filled elastomeric core (derived from a hollow, particulate filler and an elastomer such as polyurethane with a stress at 100 percent elongation of 500–4,000 psi) and two 1–10 mil high tensile-strength (stress at 2 percent elongation above 10,000 psi) skins provides a paneling material with, for example, good corrosion and impact resistance. The hollow, particulate filler loading is 20–65 volume percent of the core; and the flexural composite modulus of the sandwich-type laminate is in the range of 0.5–4 × 10^5 psi; and the density can range from about 0.5 to about 1.0 g./cm^3. These laminates have a wide variety of constructional, decorative, and insulative uses. Somewhat stiffer and thicker laminates can be provided by using more than one core alternating with a plurality of skins.

3,660,217

HONEYCOMB AND METHOD OF PRODUCING SAME

Clifton L. Kehr, Silver Spring; Walter R. Wszolek, Sykesville, and Christian B. Lundsager, Ashton, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Feb. 20, 1969, Ser. No. 800,923
Int. Cl. B32b *3/12*
U.S. Cl. 161—68 **25 Claims**



This invention relates to a method and means for laminating superimposed layers of the same or different material by adhering said layers with a novel curable liquid adhesive composition comprising a polyene and a polythiol which, on exposure to ionizing radiation or a free radical generating agent, cures to a solid adhesive under ambient conditions. The novel adhesive can be used in bonding structural cellular material such as honeycomb cores and facings.

3,660,218

HYDROPHILIC POLYMER CONTAINING SYNTHETIC LEATHER

Thomas H. Shepherd, Hopewell, and Ezekiel J. Jacob, Brooklyn, both of N.Y., assignors to National Patent Development Corporation, New York, N.Y.

Filed Oct. 15, 1968, Ser. No. 768,616
Int. Cl. B32b *5/16*
U.S. Cl. 161—87 **16 Claims**

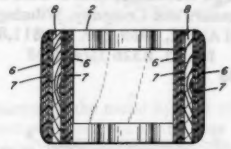
A breathable leather substitute is prepared by dispersing particles of a hydrophilic acrylate or methacrylate polymer through a sheet of a polyurethane and/or vinyl chloride polymer, laminating the sheet to a woven or non-woven fabric and heating the product to swell the hydrophilic polymer particles. The particles on the surface of the sheet are then broken by running the laminate through a sander to give a suede-like finish.

3,660,219

HETEROGENEOUS CONSTRUCTION OF TEXTILE SHUTTLE SIDE WALLS

Carl Starner Pugh, Jr., and Robert Clay Curry, both of Cincinnati, Ohio, assignors to North American Rockwell Corporation, Pittsburgh, Pa.

Filed Jan. 11, 1971, Ser. No. 105,389
Int. Cl. B32b *17/04, 21/08;* **D03i** *5/02*
U.S. Cl. 161—93 **6 Claims**



Sidewalls for loom shuttles are made of outer or wearing surfaces of unidirectional textile fabric reinforced with phenolic resin and laminated, providing a high abrasion resistant surface with a smooth finish. The next layers on each side are of glass fiber cloth coated with phenolic resin, and finally, between the glass cloth layers, a layer of bulking or filler material. This bulking or filling material layer may be another laminate of textile fabric and phenolic resin or it may be low density material, such as wood. If the bulking layer is of phenolic laminate or wood, an increased amount of rigidity results, though this is not the primary factor for rigidity, which is the result of the outer two layers on each side and particularly the glass cloth laminate layers. The sidewall construction can be fabricated either by pressing all components together as a laminate at one time or forming the individual components separately and later bonding them to form the desired structure in a separate operation.

3,660,220

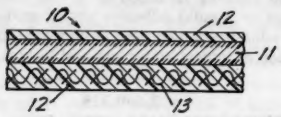
ELECTRICALLY INSULATIVE TAPE

Gaylord L. Groff, North St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of application Ser. No. 637,765, May 11, 1967, now abandoned. This application Aug. 26, 1970, Ser. No. 67,189
Int. Cl. B32b *17/06*
U.S. Cl. 161—93 **9 Claims**

Electrically insulative tape comprising a base electrically insulative sheet impregnated or coated with a resin composi-

tion that includes epoxy resin and an acid-terminated ester



reaction product of hydrogenated castor derivative and dicarboxylic acid or anhydride.

3,660,221

STRETCHABLE CREPED MICA FOIL AND METHOD THEREFOR

Hans-Werner Rotter, Nurnberg, Germany, assignor to Siemens-Schuckertwerk Aktiengesellschaft, Berlin-Siemensstadt, Erlangen, Germany

Continuation of application Ser. No. 174,462, Feb. 20, 1962, now abandoned. This application Sept. 20, 1966, Ser. No. 580,830

Claims priority, application Germany, Feb. 24, 1961, S 72704

Int. Cl. B32b *19/00, 3/28, 5/16*

U.S. Cl. 161—128 **12 Claims**

Method of producing stretchable creped mica foil includes depositing a mica suspension upon a web of creped material selected from the group consisting of fiber paper and textile material and subsequently drying the mica suspension on the web; and foil produced thereby.

3,660,222

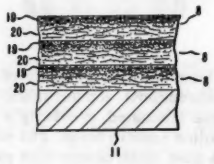
FILLING MATERIAL OF POLYESTER FIBERS

David Alexander Fleming, Jr., Wilmington, and Gilbert Douglas Rawlings, Hockessin, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 1, 1969, Ser. No. 811,819

Int. Cl. B32b *5/14, 5/28*

U.S. Cl. 161—156 **2 Claims**



A filling material of polyester fibers is formed by garnetting staple length fibers to a web then spraying a resinous bonding agent on the web and curing the resin to bond the constituent fibers. The resin is present in diminishing quantities through the web from one face to the other. A plurality of such webs may be used to form a layered structure which has a high degree of filling support weight along with a desirable degree of softness.

3,660,223

RIGID, FLEXIBLE AND COMPOSITE SOLID OBJECTS HAVING CELLULOSE CONTAINING RICE HULL PARTICLES AND RADIATION INDUCED POLYMER AND METHOD OF MAKING SAME

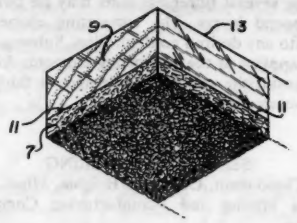
Samuel L. Casalina, 71 Paddon Road, Watsonville, Calif.

Continuation-in-part of application Ser. No. 720,331, Apr. 10, 1968. This application Sept. 16, 1968, Ser. No. 762,173

Int. Cl. B32b *5/16, 21/02*

U.S. Cl. 161—168 **7 Claims**

Discrete, cellulose containing, rice hull particles are impregnated with a monomer, usually a liquid, having a radiation activatable reaction group, molded under pressure to place the particles in substantially touching relation and form an article, and subjected to high-intensity ionizing radiation to polymerize the monomer and bind the particles into an ob-



ject of stable shape. Additionally, the monomer may be selected to produce objects that are rigid and hard or flexible and resilient. A composite layered article is also disclosed.

3,660,224

METHOD FOR MAKING ADHERE TO EACH OTHER CURED LAYERS OF EPM OR EPDM ELASTOMERS AND/OR BUTYL RUBBER AND PRODUCTS THUS OBTAINED

Pasqualino Cau, Oggiono, and Ermes Anelli, Milan, both of Italy, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Jan. 30, 1970, Ser. No. 7,217

Claims priority, application Italy, Feb. 3, 1969, 12354 A/69; Sept. 10, 1969, 21833 A/69

Int. Cl. B27b *27/08;* **B29h** *5/02*

U.S. Cl. 161—252 **7 Claims**

The present invention relates to a process for making adhere or for welding together layers or shaped articles such as plates, sheets, tube-tires, and the like, based on cured synthetic elastomers chosen from among the group including: copolymers and/or terpolymers of ethylene, of an alpha-olefine and optionally of a polyene, (for example EPM and EPDM rubber), and/or butyl rubber, by interposing between the layers to be caused to adhere a plastomeric layer consisting of thermoplastic polymers and/or copolymers, free of polar substituting groups or of reactive groups, of ethylene, propylene and/or butene, and by the successive heating under pressure of the associated layers.

3,660,225

DELIGNIFICATION AND BLEACHING OF CELLULOSE PULP LAYERS WITH OXYGEN GAS

Abraham Jacob Verreyne, Petersfield; Leonard Austin Job, Bramley North, both of Republic of South Africa; Paul Rerolle, Nogent-sur-Marne, and Johan C. F. C. Richter, St. Jean Cap Ferrat, both of France, assignors to South African Pulp and Paper Industries Limited and L'Air Liquide, Societe Anonyse pour L'Etude et L'Exploitation des Procedes Georges Claude and Aktiebolaget Kamyr

Filed July 10, 1969, Ser. No. 840,639

Claims priority, application Sweden, July 11, 1968, 9540/68; July 15, 1968, 9689/68; Jan. 22, 1969, 868/69; South Africa, Oct. 14, 1968, 68/6629

Int. Cl. D21c *3/26*

U.S. Cl. 162—17 **11 Claims**

A method of dividing a stream of pulp into a series of layers comprising discrete batches and progressively transferring the batches from layer to layer in controlled fashion so that the height of each layer does not exceed a maximum value at which the pulp at the bottom of a layer has a predetermined minimum gaseous content, the pulp being contacted with oxygen gas under pressure while progressively transferring pulp from one layer to the next in the series. The method may occur in an apparatus comprising a cylindrical pressure vessel including axially spaced floors which define chambers between them, the chambers being subdivided into a plurality of compartments by dividing walls disposed axially

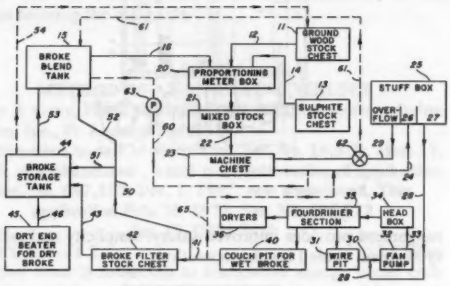
to the pressure vessel and transversely to the floors, each floor having an aperture and the compartments and floors being relatively movable to allow pulp in the compartments sequentially to be transferred from one chamber to the next as relative movement occurs.

3,660,226

PAPER MACHINE BROKE CONTROL

Lewis A. McKeown, 473 Mayfair Avenue, Ottawa, 3 Ontario, Canada

Filed June 10, 1970, Ser. No. 44,936
Claims priority, application Canada, June 11, 1969, 054,067
Int. Cl. D21f 1/66
U.S. Cl. 162—264 **8 Claims**



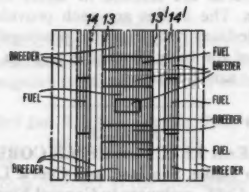
There is described a paper making system that includes (1) a broke tank, couchpit or other receptacle for broke stock fibers and (11) a machine chest or other container that feeds a supply of suitably prepared fibers to the paper machine. The invention is the improvement that comprises means of restricting the flow of suitably prepared fibers from the machine chest, and in their place feeding broke stock fibers from the broke tank, couchpit or other receptacle for broke stock fibers so that, when the paper making system is malfunctioning, the paper machine can be kept running on substantially broke stock. The system has the advantage of being able to avoid the excessive production of broke.

3,660,227

NUCLEAR REACTORS

Ronald Tunstal Ackroyd, Upton-by-Chester, and Maurice Arthur Perks, Stockton Heath, near Warrington, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Nov. 4, 1969, Ser. No. 873,922
Claims priority, application Great Britain, Nov. 15, 1968, 54,439/68
Int. Cl. G21c 1/02
U.S. Cl. 176—17 **5 Claims**



A core configuration for a liquid metal cooled fast breeder nuclear reactor includes a generally cylindrical breeder region, a first fissile region which completely embraces the central breeder region, a second fissile region wholly or partially surrounding said first fissile region with axial and radial clearance, an inner breeder region occupying said clearance, and an outer breeder region extending from the outer boundary of the second fissile region to the boundary of the core itself, which is generally cylindrical.

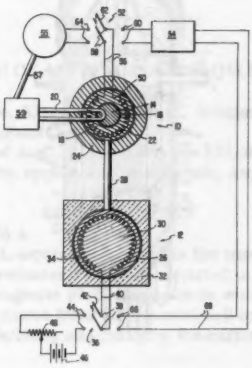
A variation envisages the second fissile region only partially surrounding the first fissile region, the "corner" portions being occupied by breeder material in place of the fissile material of a completely embracing second fissile region.

3,660,228

NUCLEAR REACTOR CONTROL WITH REFLECTOR AND ABSORBER MEANS

Robert E. Magladry, Baltimore, Md., assignor to Teledyne, Inc., Los Angeles, Calif.

Filed Nov. 6, 1967, Ser. No. 680,658
Int. Cl. G21c 7/00
U.S. Cl. 176—20 **13 Claims**



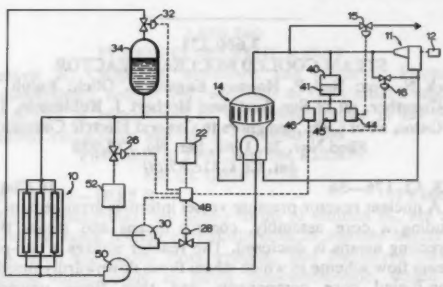
A nuclear reactor of the metal hydride control type. Metal hydride is in two portions, one in the core and the other exterior of the core, and means are provided for permitting flow of hydrogen between the two portions. Control of reactivity is obtained by providing heating means in one or both portions, the heating being responsive to a neutron sensor.

3,660,229

REACTOR CONTROL SYSTEM

Herbert N. Klingbeil; Walter W. Cliffe, and William A. Castell, all of Peterborough, Ontario, Canada, assignors to Canadian General Electric Company Limited

Filed Feb. 7, 1969, Ser. No. 797,447
Int. Cl. G21c 7/00
U.S. Cl. 176—20 **8 Claims**



A method of controlling the pressure in the primary circuit of a nuclear power plant in which the fluid in the primary cir-

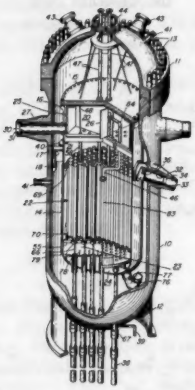
cuit is liquid and the circuit has a surge tank and spray means for condensing vapors in the tank. The pressure in the primary circuit is controlled by controlling the spray means in response to the pressure in the secondary circuit.

3,660,230

NUCLEAR REACTOR CONTROL SYSTEM

Herbert S. Bailey, Jr., Mountain View, and Samuel L. Stewart, Campbell, both of Calif., assignors to General Electric Company

Filed Nov. 26, 1968, Ser. No. 779,132
Int. Cl. G21c *7/10*
U.S. Cl. 176—36 R **1 Claim**



A nuclear reactor control system is described in which reactivity in the core is controlled by neutron absorbing material which is moved into and out of the fuel containing core region. Neutron moderating material is included in followers connected to the neutron absorbing control elements so that the moderating material is brought into the core fuel region when the neutron absorbing material is removed therefrom. This system is especially applicable to a reactor of the fast neutron breeder type. The use of moderating material in a fast reactor core improves the inherent safety characteristics of the core by improving the Doppler reactivity effect and coolant voiding reactivity. The incorporation of the moderating material in control material followers results in improvement in core fissile requirement, breeding ratio and core conversion ratio.

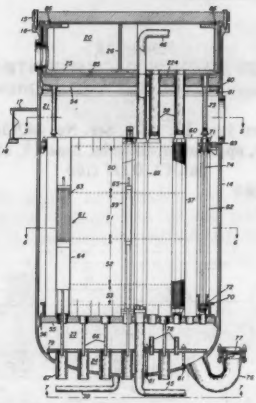
3,660,231

STEAM COOLED NUCLEAR REACTOR

Jack N. Fox; Ned P. Hansen; Eugene E. Olich; Ralph W. Guenther, all of San Jose, and Herbert J. Rubinstein, Los Gatos, all of Calif., assignors to General Electric Company

Filed Nov. 26, 1968, Ser. No. 778,998
Int. Cl. G21c *15/00*
U.S. Cl. 176—56 **16 Claims**

A nuclear reactor pressure vessel internals arrangement including a core assembly, control means and steam flow directing means is disclosed. The reactor utilizes a two-pass steam flow scheme in which steam flows downwardly through non-fueled core components and then flows upwardly through the fuel assemblies. The reactor internals are located within a shroud which forms a second pressure-tight vessel. Water located in an annular space between the internal shroud and the main pressure vessel provides additional shielding and is readily available for core flooding. The arrangement provides improved safety, simplicity and reliability in steam cooled reactor operation.

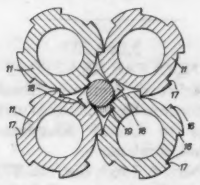


3,660,232

INTERLOCKED ASSEMBLY OF BLOCKS FOR A NUCLEAR REACTOR MODERATING CORE

Robert Banks, Timperley, Cheshire, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Mar. 13, 1969, Ser. No. 806,958
Claims priority, application Great Britain, Mar. 21, 1968, 13,841/68
Int. Cl. G21c *5/00, 5/14*
U.S. Cl. 176—84 **5 Claims**



A moderator structure is provided wherein bodies of moderator material are stacked in layers to provide juxta posed columns. The bodies are each provided with splines which have side faces lying in planes passing through the longitudinal axis of the body. Bodies in a given layer abut one another only by said side faces.

3,660,233

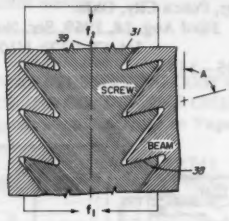
NUCLEAR REACTOR UPPER CORE GRID

Charles Arthur Dalke, San Jose, and Cedric L. Child, Cupertino, both of Calif., assignors to General Electric Company

Filed Nov. 12, 1969, Ser. No. 875,928
Int. Cl. G21c *3/00*
U.S. Cl. 176—87 **6 Claims**

A fuel assembly top guide for the fuel core of a nuclear reactor including screws having threads with an acute in-

cluded angle between the thread pressure flank face and the



screw axis for fastening the notched intersections of the beams forming the top guide.

3,660,234

METHOD OF ATTENUATING VIRUSES

Oscar S. Gray, Fort Lauderdale, Fla., assignor to Gray Industries, Inc., Ft. Lauderdale, Fla.

Continuation-in-part of application Ser. No. 19,520, Mar. 17, 1970, now abandoned, which is a continuation of application Ser. No. 687,157, Dec. 1, 1967, now abandoned. This application Feb. 16, 1971, Ser. No. 115,812
Int. Cl. C12r 7/00
U.S. Cl. 195—1.2 13 Claims

A live virus is subjected to microwave energy under controlled conditions whereby the virus is attenuated to a less virulent state.

The present invention relates to a novel method for attenuating live viruses; and, more particularly, the present invention relates to a novel method for quickly attenuating viruses in a simple, controlled and reproducible manner.

3,660,235

METHOD FOR PRODUCING PHENYLALANINE BY FERMENTATION

Shinji Okumura, Tokyo; Shinichiro Otsuka, Yokohama; Akio Yamanoi, Tokyo; Fumihiro Yoshinaga, Kawasaki; Takeshi Honda, Yokohama; Koji Kubota, Tokyo, and Takayasu Tsuchida, Kawasaki, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Aug. 14, 1970, Ser. No. 63,953
Claims priority, application Japan, Aug. 22, 1969, 44/66374; Oct. 29, 1969, 44/86601
Int. Cl. C12d 13/06
U.S. Cl. 195—29 11 Claims

Mutants of microorganisms of the genere Brevibacterium, Corynebacterium, Arthrobacter, Bacillus, and Candida which tolerate amounts of phenylalanine analogues sufficient to inhibit growth of the parent strains produce extracellular L-phenylalanine in conventional culture media in amounts sufficient to warrant recovery.

3,660,236

PRODUCTION OF GLUCOAMYLASE

Robert G. Dworschack, and Carolyn A. Nelson, both of Clinton, Iowa, assignors to Standard Brands Incorporated, New York, N.Y.

Filed Jan. 8, 1969, Ser. No. 789,964
Int. Cl. C12d 13/10
U.S. Cl. 195—65 13 Claims

The disclosure is directed to the production of the enzyme glucoamylase. During the growth of glucoamylase producing microorganisms, ammonium hydroxide or ammonia gas is introduced into the growth medium to provide a source of ammonia and to maintain the pH of medium at the level where optimum growth of the microorganisms occurs.

3,660,237

PROCESS FOR OBTAINING KALLEKREIN FROM PANCREAS OR SUBMANDIBULARIS GLANDS OF PIGS

Fritz Schultz, Wuppertal-Sonnborn, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 19, 1970, Ser. No. 38,906
Int. Cl. C07g 7/026
U.S. Cl. 195—66 R 4 Claims

The extraction of Kallekrein from the pancreas and submandibularis gland of pigs is carried out by subjecting the fresh comminuted glands at about room temperature with an aqueous solution of a salt, such as sodium chloride, of a concentration of from 3 to 25%, preferably 8% of the salt, at a pH value of 5.5 to 9.5, preferably 7.5 to 8.5, in the presence of a water-miscible solvent such as methanol, and the mixture stirred for about 1 hour. The aqueous kallekrein-containing phase is separated from the solids and the kallekrein precipitated in the presence of kieselguhr and acetone. High yields and great reduction in extraction time are noted.

3,660,238

EXTRACTION OF ASPARAGINASE FROM BACTERIAL CULTURE

Henry E. Wade, Kings Bridge Mead, Stratford-Sub-Castle, Salisbury, England

Filed Aug. 21, 1969, Ser. No. 852,082
Claims priority, application Great Britain, Aug. 23, 1968, 40,344/68
Int. Cl. C07g 7/028
U.S. Cl. 195—66 A 16 Claims

The enzyme L-asparaginase, used in the treatment of leukemia and disseminated cancer, is extracted in high yield by treating L-asparaginase producing bacteria with strong alkali to release the enzyme from the bacterial cell in soluble form and thereafter isolating and purifying the enzyme by conventional methods.

3,660,239

FIBRINOLYSOKINASES FROM STREPTOMYCES

Werner Frommer, and Otto Wagner, both of Wuppertal-Elberfeld, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 18, 1969, Ser. No. 877,818
Claims priority, application Germany, Nov. 22, 1968, P 18 10 277.7
Int. Cl. C12d 13/10
U.S. Cl. 195—66 B 5 Claims

Fibrinolysokinase of good stability is isolated from culture solutions of actinomycetes by heat treatment at a low pH followed by fractional precipitation.

3,660,240

FLAVIN CO-ENZYME ASSAY

Emmett W. Chappelle, Baltimore, and Grace L. Picciolo, Bladensburg, both of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed May 5, 1969, Ser. No. 822,039
Int. Cl. G01n 31/14
U.S. Cl. 195—103.5 R 11 Claims

Flavin coenzymes, the active forms of vitamin B_2, are assayed by using boiling perchloric acid to rupture bacterial cells, free the flavin from protein, and hydrolyze flavin adenine dinucleotide to flavin mononucleotide, which is reduced with sodium borohydride and palladium chloride and reacted with the enzyme luciferase to produce light with intensity directly proportional to flavin concentration.

3,660,241

CONTAINER FOR ORGAN PERFUSION OR THE LIKE

Paul Joseph Michielsen, Herent, Belgium, assignor to Baxter Laboratories Inc., Morton Grove, Ill.

Filed Jan. 12, 1970, Ser. No. 2,231
Int. Cl. C12k 9/00
U.S. Cl. 195—127 6 Claims

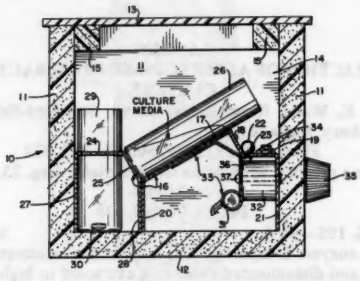
A container having at least one access port defined therein; and a flexible conduit passing through the access port in sealing relation, in which the conduit is slideable relative to the port without disruption of the seal.

3,660,242

INCUBATOR

Harry W. Gordon, Bronx, N.Y., and Gustav Fingado, Ho Ho Kus, N.J., assignors to Julius Schmid, Inc., New York, N.Y.

Filed Mar. 5, 1970, Ser. No. 16,681
Int. Cl. C12b 1/00
U.S. Cl. 195—139 7 Claims



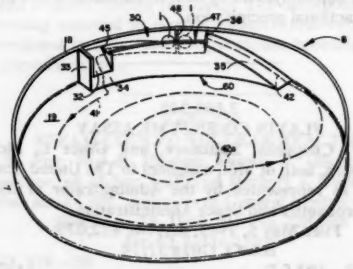
An incubator is described that comprises an insulated chamber in which heating of a culture media takes place by conduction and the incubator is designed to prevent overheating of the culture media and provide uniform temperature control. The incubator has a broad field of application and is particularly adapted because of its compactness for use in a physician's office.

3,660,243

PETRI DISH WITH COMPARTMENT FOR STERILIZED SPREADING ELEMENT

Cecil G. Young, La Canada, Calif., assignor to North American Rockwell Corporation

Filed Mar. 16, 1970, Ser. No. 20,010
Int. Cl. C12k 1/10
U.S. Cl. 195—139 12 Claims



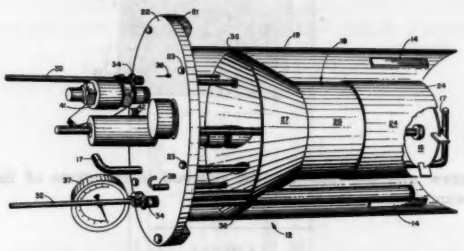
A petri dish compartment for a sterile ball for use with an automatic spreading element is provided with at least one sloping surface for release and recovery of the ball. The sloping surface has its highest point adjacent a recessed area in the compartment, the recessed area housing the spreading element prior to and after streaking.

3,660,244

FERMENTATION APPARATUS

Chi-Sin Che, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Aug. 14, 1969, Ser. No. 850,124
Int. Cl. C12b 1/10
U.S. Cl. 195—143 7 Claims



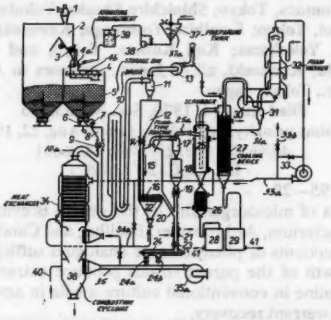
A fermentation apparatus is provided having a reactor vessel, baffle means, impellor means, and a telescopeable draft tube means which enables the upper portion of the draft tube means to be raised and lowered with respect to the lower portion of the draft tube means.

3,660,245

APPARATUS FOR CONTINUOUS MANUFACTURE OF FURFURAL AND ACETIC ACID

Anrej Zelnik; Frantisek Rendos; Frantisek Kozmal; Radislav Domansky, all of Bratislava, and Josef Pajtik, Zvolen, all of Czechoslovakia, assignors to Ceskoslovenska Akademie Ved, Prague, Czechoslovakia

Filed May 21, 1965, Ser. No. 457,867
Claims priority, application Czechoslovakia, May 22, 1964, 2970-64. The portion of the term of the patent subsequent to May 2, 1987, has been disclaimed.
Int. Cl. C10b 49/10, 1/04
U.S. Cl. 202—99 3 Claims



An apparatus for continuously producing furfural and acetic acid by thermodecomposition of ligneous and similar raw materials in the presence of the catalyst and in an inert atmosphere. A source of raw material is provided, a source of catalyst and a source of heated inert gaseous carrier. A drier is provided. Means are provided for conveying raw material and catalyst from the respective sources to the drier and for impregnating such raw material with the catalyst. Reactor means are provided and means for conveying impregnated raw material from the drier into the reactor means in a first direction. Pneumatic conveyor means conveys heated carrier from the respective source through and beyond the reactor means in a direction counter to the first direction so that the impregnated material yields distillate and solid particulate matter which is entrained by the carrier.

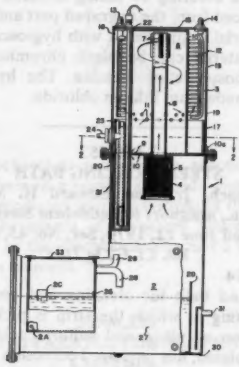
Means are provided for separating the solid particulate matter from the carrier downstream of the reactor means. Condensor means separate distillate from the carrier downstream of the reactor means.

3,660,246

DISTILLATION APPARATUS HAVING CONCENTRIC RISER, EXPANSION AND CONDENSING CHAMBERS

Verity C. Smith, Dedham, Mass., assignor to Vaponics, Inc., Waltham, Mass.

Filed Aug. 13, 1969, Ser. No. 849,741
Int. Cl. B01d *3/00*
U.S. Cl. 202—187 **2 Claims**



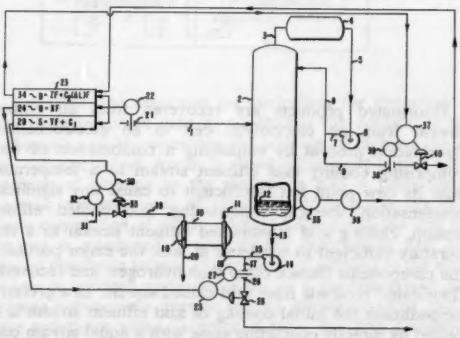
An apparatus and process for purifying water by distillation and subsequent condensation. The impure water is heated to form a distillate which is moved in a rotational path, expanded condensed and recovered. The recovered condensate contacts only materials not imparting impurities thereto and does not contact the outer shell of the purifying apparatus. Rotational movement is imparted by means of a riser having baffled openings from which the steam exits into an expansion zone.

3,660,247

PROCESS AND APPARATUS FOR CONTROLLING WITH A COMPUTER A DISTILLATION COLUMN PRODUCT AND HEAT FLUID RATES OF FLOW

Roger G. E. Franks, Wilmington, Del., and Steven L. Ritchey, Clark, N.J., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed July 31, 1970, Ser. No. 59,941
Int. Cl. B01d *3/42*; C07c *119/04*
U.S. Cl. 203—1 **4 Claims**



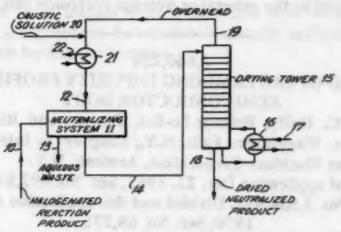
A process and apparatus for controlling a distillation column, especially useful for purifying tolylene diisocyanate. The process comprises (a) selectively proportioning both the reboiler steam flow rate and the column bottoms take-off rate to the distillation column feed rate and (b) adjusting the distillate take-off rate in accordance with variations in the distillation column feed rate and deviations in the level of the column bottoms.

3,660,248

NEUTRALIZATION AND DRYING OF HALOGENATED AND ALKYLATED HYDROCARBONS

Utah Tsao, Jersey City, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Filed Mar. 6, 1969, Ser. No. 804,842
Int. Cl. B01d *3/34*; C07c *19/00*
U.S. Cl. 203—7 **15 Claims**



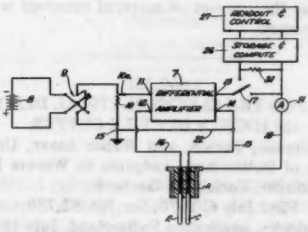
Halogenated and alkylated products containing corrosive acids are neutralized and dried by contact with caustic in a neutralization system in which the neutralized product is separated into aqueous and organic phases. The organic phase is azeotropically distilled in a drying tower to obtain neutralized, dried halogenated product and an overhead containing halogenated product, water and trace amounts of the corrosive acid formed during the distillation. The overhead is recycled to the neutralization system after being mixed with caustic upstream of the neutralization system, whereby the need to protect the neutralization system and recycling system from the effects of the corrosive acid is avoided.

3,660,249

METHOD AND APPARATUS FOR DETERMINING BOTH THE AVERAGE CORROSION RATE, AND THE PITTING TENDENCY, SUBSTANTIALLY INDEPENDENTLY OF THE RESISTANCE OF THE ELECTROLYTE

Clarence R. Townsend, Anaheim, Calif., assignor to Magna Corporation, Sante Fe Springs, Calif.

Filed Feb. 5, 1970, Ser. No. 8,809
Int. Cl. G01n *27/26*
U.S. Cl. 204—1 T **20 Claims**



The method makes use of three electrodes which are exposed to the corrosive environment, the electrodes being the corroding or test electrode, the reference electrode, and the auxiliary electrode. The corroding electrode is made 10 millivolts positive relative to the reference electrode, and is then made 10 millivolts negative relative thereto. The anodic and

cathodic currents which flow through a circuit including the corroding electrode and the auxiliary electrode are then averaged to produce an indication of the general or average corrosion rate, there being no substantial error due to the resistance of the electrolyte. The difference between such anodic and cathodic currents is determined in order to provide the pitting tendency or pitting index of the system. In accordance with a second embodiment of the method, the corroding electrode is forced to be at the same potential as that of the reference electrode. The current which then flows through a circuit including the corroding electrode and the auxiliary electrode is measured by a microammeter and is the pitting tendency of the system. Thereafter, the microammeter is caused to read zero despite the fact that current is passing therethrough, and the corroding electrode is forced to be at a 10 millivolt potential difference from the reference electrode. The reading of such microammeter is then directly proportional to the general or average corrosion rate.

3,660,250

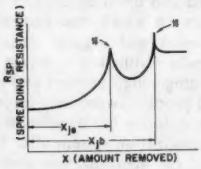
METHOD OF DETERMINING IMPURITY PROFILE OF A SEMICONDUCTOR BODY

Michael C. Duffy, Boissise-Le-Roi, France, and Richard L. Hudson, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Original application Dec. 22, 1967, Ser. No. 692,817, now Patent No. 3,554,891. Divided and this application Aug. 31, 1970, Ser. No. 68,271

Int. Cl. G01n *27/04*

U.S. Cl. 204—1 T **9 Claims**



A machine and method for automatically determining the distribution of impurities contained in a semiconductor body. The machine is particularly useful in determining the depth of very shallow junctions in the order of one-half micron and less. The machine successively anodizes the surface of the semiconductor body to produce an anodized semiconductor layer, removes the anodized layer by chemical etching, measures an electrical characteristic, such as spreading resistance and sheet resistance, of the semiconductor body and records the electrical characteristic in terms of the characteristic versus the amount of material removed. The machine automatically repeats this cycle until a resistivity profile for the desired depth of material is obtained. A sharp change will be observed in the recorded profile of the electrical characteristic versus the amount of material removed when a PN junction is crossed.

3,660,251

METHOD FOR THE ELECTROLYTICAL DEPOSITION OF HIGHLY DUCTILE COPPER

Werner Fluhmann, Zurich, and Walter Saxer, Urdorf, Zurich, both of Switzerland, assignors to Werner Fluhmann and Galvanische, Zurich, Switzerland

Filed July 6, 1970, Ser. No. 52,730

Claims priority, application Switzerland, July 10, 1969, 10563/69

Int. Cl. C23b *5/48, 5/18;* **B01k** *3/00*

U.S. Cl. 204—15 **14 Claims**

A homogenous, brittle-free, pore-free and dense copper layer of high ductility and having a content of included gases and/or organic impurities of less than 100 ppm is electrolytically deposited on electrically conducting surfaces from a bath comprising the copper ion and the pyrophosphate ion by maintaining the electrolytic bath constantly free from particles having a size substantially exceeding 3 microns.

3,660,252

METHOD OF MAKING ENGRAVED PRINTING PLATES

Gualtiero Giori, Lausanne, Switzerland, assignor to De La Rue Giori S.A., Lausanne, Switzerland

Filed June 17, 1970, Ser. No. 47,114

Int. Cl. B41n *1/04;* **B41b** *1/02;* **B41m** *5/00*

U.S. Cl. 204—17 **11 Claims**

An engraved printing plate for steel or copper plate printing machines, includes an engraved part made of a material which accepts a coloring or inking material and a non-engraved part spaced from the engraved part and having a layer of porous material impregnated with hygroscopic substance. The porous material can be black chromium or be made from nickel phosphide or alumina. The hygroscopic substance can be made from lithium chloride.

3,660,253

STEEL PICKLING BATH

Stewart E. Rauch, Jr., and Edward H. Mayer, both of Bethlehem, Pa., assignors to Bethlehem Steel Corporation

Filed June 12, 1970, Ser. No. 45,929

Int. Cl. C23g *1/08*

U.S. Cl. 204—34 **3 Claims**

A method and bath for cleaning and conditioning steel prior to tinplating in which the strip is pickled in a dilute aqueous solution of nitric and sulfuric acids. The pickled strip, when tinplated, has improved corrosion resistance.

3,660,254

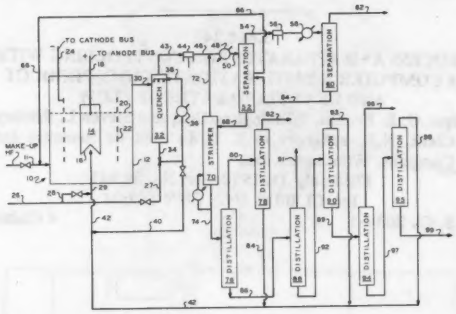
RECOVERY OF PRODUCTS FROM ELECTROCHEMICAL FLUORINATION

Robert O. Dunn, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed June 8, 1970, Ser. No. 44,041

Int. Cl. B01k *3/00*

U.S. Cl. 204—59 **14 Claims**

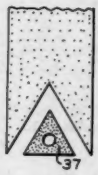


Fluorinated products are recovered from an effluent stream from an electrolytic cell in an electrochemical fluorination process by employing a combination of steps comprising cooling said effluent stream to a temperature near its dew point but insufficient to cause any significant condensation thereof, compressing said cooled effluent stream, chilling said compressed effluent stream to a temperature sufficient to condense at least the major portion of the components thereof other than hydrogen, and recovering fluorinated products from said chilled stream. In a preferred embodiment the initial cooling of said effluent stream is effected by directly contacting same with a liquid stream comprising the feedstock to the electrolytic cell.

3,660,255
PROCESS FOR ELECTROCHEMICAL CONVERSION

Homer M. Fox; Forrest N. Ruehlen, and Keith A. Williams, all of Bartlesville, Okla., assignors to Phillips Petroleum Company

Continuation of Ser. No. 739,476, June 24, 1968, abandoned.
Filed Sept. 24, 1970, Ser. No. 75,291
Int. Cl. B01k *3/00*
U.S. Cl. 204—59 10 Claims

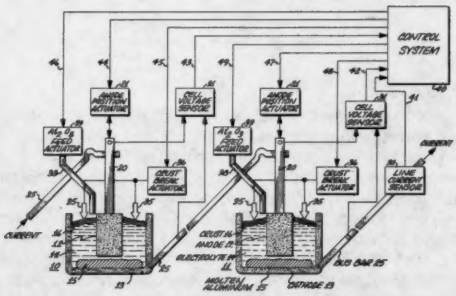


In an electrochemical process, the reaction takes place within the confines of a porous electrode element. The feed materials are introduced into the bottom of this porous electrode element by means of a sparger which is positioned within the bulk of the electrolyte adjacent a bottom surface of said electrode element.

3,660,256
METHOD AND APPARATUS FOR ALUMINUM POTLINE CONTROL

David L. Lippitt, Scotia, N.Y., and Rainer W. Schlunk, Schenectady, both of N.Y., assignors to General Electric Company

Filed Dec. 7, 1967, Ser. No. 688,810
Int. Cl. C22d *3/12, 3/02*
U.S. Cl. 204—67 5 Claims



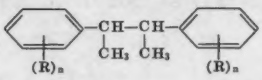
A method and apparatus for controlling the operation of aluminum reduction cells by controlling the position of the cell anode and by controlling the addition of alumina ore to the cell electrolyte. Anode position adjustment occurs after addition of alumina to the electrolyte and is based upon periodic measurements of resistance drop across the cell. Upon completion of anode position adjustment, the cell resistance is monitored by periodically determining first and second resistance values. The addition of alumina to the electrolyte is initiated upon detection of a predetermined difference between the current second resistance value and a base resistance value determined from the first resistance values.

3,660,257
ELECTROLYTIC PROCESS FOR THE PREPARATION OF α-METHYLBENZYL DIMERS FROM SULFONIUM COMPOUNDS

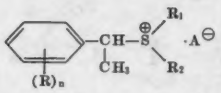
William J. Settineri, and Ritchie A. Wessling, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 2, 1969, Ser. No. 881,574
Int. Cl. C07b *29/06;* C07c *1/00, 15/18*
U.S. Cl. 204—72 10 Claims

α-Methylbenzyl dimers having the formula



wherein *n* is an integer from 0 to 5 and R is an inert substituent, are prepared by electrochemically reducing a sulfonium salt having the formula

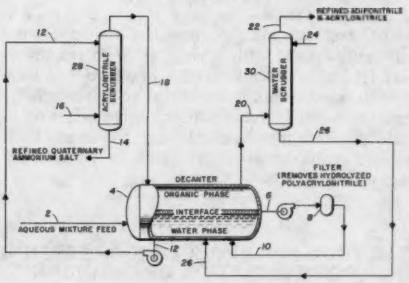


wherein R_1 and R_2 are alkyl or hydroxy-substituted alkyl groups and A^- is an electrolytically acceptable anion. The reduction and coupling occur at a mercury cathode without the formation of organomercury compounds.

3,660,258
PROCESS OF REMOVING HYDROLYZED POLYACRYLONITRILE FROM AN AQUEOUS MIXTURE

Donald E. Danly, Pensacola, Fla., and Andrew M. Patterson, Jr., Decatur, Ala., assignors to Monsanto Company, St. Louis, Mo.

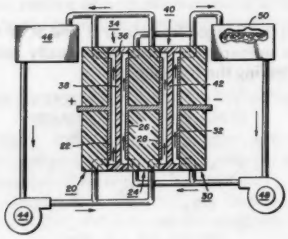
Continuation-in-part of application Ser. No. 618,248, Jan. 30, 1967. This application Jan. 23, 1970, Ser. No. 5,440
Int. Cl. C07b *29/06;* C07c *121/25, 121/28*
U.S. Cl. 204—73 7 Claims



Hydrolyzed polyacrylonitrile is removed from an aqueous mixture consisting essentially of a quaternary ammonium salt, adiponitrile, acrylonitrile and hydrolyzed polyacrylonitrile by containing the mixture at a temperature up to about 45° C. and for at least about one hour to form an organic phase and a water phase, the phases separated by an interface (the interface not being definitely defined but consisting essentially of an emulsion

which consists essentially of the hydrolyzed polyacrylonitrile), and withdrawing a portion of the interface and filtering said portion to remove the hydrolyzed polyacrylonitrile.

3,660,259
ELECTROLYTIC CELL
Donald E. Danly and Robert W. McWhorter, Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.
Original application May 31, 1966, Ser. No. 553,851. Divided and this application Mar. 25, 1969, Ser. No. 810,123
Int. Cl. C07b *29/06*; C07c *121/26*; B01k *1/00*
U.S. Cl. 204—73 A **3 Claims**



An ion exchange membrane divides an electrolytic cell into separate anolyte and catholyte compartments. Spacer strips between the membrane and cathode define smooth-walled catholyte passages between the membrane and cathode. The spacer strips are parallel to catholyte flow. Anolyte pressure is slightly higher than catholyte pressure. The dimensions of the membrane frame are chosen to seal against the anode and cathode blocks without distorting the electrodes.

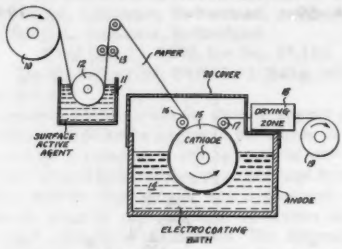
3,660,260
PHOTOSYNTHESIS OF ALKOXYOXETANES
Sigfried H. Schroeter, Schenectady, N.Y., assignor to General Electric Company
No Drawing. Original application Sept. 29, 1967, Ser. No. 671,576. Divided and this application Apr. 27, 1970, Ser. No. 43,282
Int. Cl. B01j *1/10*
U.S. Cl. 204—158 R **6 Claims**

Alkoxyoxetanes are produced by the reaction of an aldehyde or ketone with a vinyl ether in the presence of ultraviolet light. The alkoxyoxetanes produced in accordance with this invention are useful as solvents for chemical reactions and as monomers for polymerization to polyoxyalkylene compounds employing, for example, trialkyl aluminum compounds with water in accordance with known processes.

3,660,261
METHOD FOR REDUCTION OF BROMINE CONTAMINATION OF CHLORINE
Edward R. Wright, Freeport, and Bobby G. Messick, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Apr. 20, 1970, Ser. No. 30,352
Int. Cl. C01d *1/06, 1/08*; B01k *1/00*
U.S. Cl. 204—98 **7 Claims**

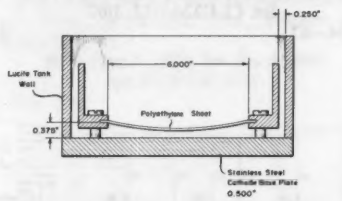
Disclosed is a method for reducing the amount of bromine contamination in free chlorine produced by the electrolysis of brine containing chloride and bromide ions. The method involves oxidizing the bromide to bromate and maintaining the pH of the brine at a value of from 2.0 to 6.5 during the electrolysis.

3,660,262
PRODUCTION OF ELECTROPHOTOGRAPHIC PAPER BY ELECTROPHORETIC DEPOSITION
Lester L. Spiller, Indianapolis, Ind., assignor to Ransburg Electro-Coating Corp., Indianapolis, Ind.
Filed June 19, 1969, Ser. No. 834,815
Int. Cl. B01k *5/02*
U.S. Cl. 204—181 **14 Claims**



Electrophotographic paper is provided by electrophoretically depositing on paper zinc oxide and a resinous binder associated therewith from nonaqueous medium at the cathode of a unidirectional electrical system.

3,660,263
HOSTILE ENVIRONMENT PROTECTION OF CRITICAL METALLIC SURFACES BY ELECTROPHORETICALLY DEPOSITED COATINGS
Lucien V. Auletta, Wappingers Falls, Blair E. Cornish, Stone Ridge, Eugene P. Damm, Jr., and Mark A. Faigenaum, Poughkeepsie, and Andrew M. Simon Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Poughkeepsie, N.Y.
Filed Oct. 28, 1969, Ser. No. 871,825
Int. Cl. B01k *5/02*; C23b *13/00*
U.S. Cl. 204—181 **5 Claims**

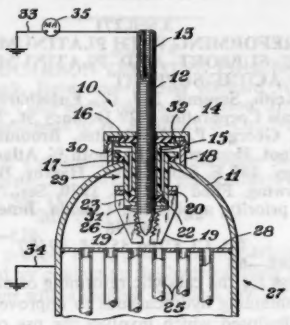


Application techniques and material design properties and formulations are described for electrophoretically deposited hostile environment protective coatings for exposed critical metallic surfaces. Formulation properties and examples of electrophoretically depositable aqueous polymer latices and/or co-blends of aqueous polymer latices are disclosed. Said latices and/or latice blends having such desirable coating properties as low gas transmission, adhesion, non-flammability crack resistance, flexibility, selected and useful dye compatibility, requisite thickness, electrical requirements and chemical resistance, are illustrated for the generic latice blends, polyvinylidene chloride (saran) and epoxy ester.

3,660,264
SACRIFICIAL ANODE ASSEMBLY FOR VESSEL INTERIORS
Karl Wilhelm Schuller, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.
Filed July 22, 1970, Ser. No. 57,267
Int. Cl. C23f *13/00*
U.S. Cl. 204—197 **5 Claims**

Sacrificial anode assemblies for the protection of vessel interiors are provided with means for adjusting anode surface exposure to maintain a uniformly protective

potential. A packing gland assembly positioned within a port in a vessel wall allows adjustment of anode exposure from the outside of the vessel. The sacrificial anode is in



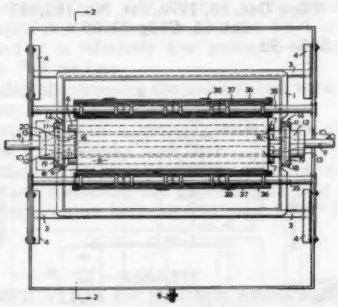
the form of a rod which may be moved in or out against the frictional engagement of a seal ring compressed within the packing gland.

3,660,265

TANK FOR METAL PLATING CYLINDERS

Tauno M. Kangas, 1578 Alexandra Blvd., Port Credit, Peel, Ontario, Canada

Filed June 3, 1970, Ser. No. 42,960
Int. Cl. C23b *5/68, 5/56*
U.S. Cl. 204—212 **4 Claims**



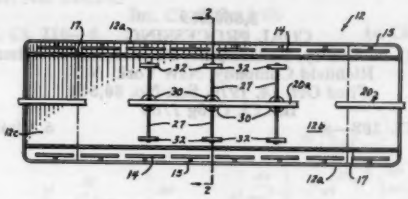
An apparatus for use in electroplating a metal onto the surface of a cylinder having a shaft extending from either end thereof, said apparatus comprising a tank for containing electrolyte, a cylindrical sleeve resistant to attack by said electrolyte adapted for releasable fixed location on each shaft with one end thereof in leak-proof abutment with an end of said cylinder, each sleeve being of a length such that the total distance between the remote ends of the sleeves on said shafts is greater than the distance between a pair of opposite walls of said tank, each of said opposite walls of said tank having a recess in the upper edge thereof dimensioned to releasably accommodate the sleeves extending therethrough with the cylinder located for rotation in said tank to form the cathode during the electroplating, each recess being adapted to releasably receive dam means to close said recess such that the level of the electrolyte in said tank may be raised to completely immerse the cylinder during the electroplating, said dam means including mutually separable bottom and top members defining a circular opening dimensioned for slidable fit with the sleeve extending therethrough and anode means for containing said metal to be plated.

3,660,266

ELECTROCOATING EQUIPMENT ACCESSORY

Robert L. Koch II and James H. Muehlbauer, Evansville, Ind., assignors to Ashdee Corp., Evansville, Ind.

Filed Feb. 12, 1968, Ser. No. 704,920
Int. Cl. B01k *5/02*; C23b *13/00*
U.S. Cl. 204—300 **5 Claims**



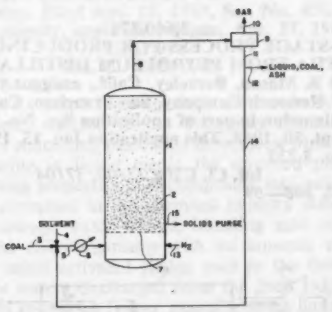
An accessory for electrocoating equipment characterized by a floating helper electrode assembly movable with respect to fixed electrodes disposed on the sides of an electrocoating tank, and where electrical energy induced in such floating helper electrode assembly is passed within a hollow article being coated for effective inner coating action.

3,660,267

COAL PROCESSING

Robert W. Rieve, Springfield, and Harold Shalit, Drexel Hill, Pa., assignors to Atlantic Richfield Company, New York, N.Y.

Filed Oct. 14, 1970, Ser. No. 80,662
Int. Cl. C10g *1/04*
U.S. Cl. 208—8 **7 Claims**



A method for hydrogenating coal to at least partially liquify same wherein the hydrogenation is carried out in at least one zone containing an ebullated bed of substantially inert, solid contact particles.

3,660,268

RECOVERY OF OIL FROM TAR SANDS USING HIGH WATER CONTENT OIL-EXTERNAL MICELLAR DISPERSIONS

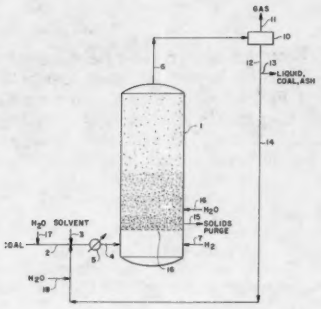
Joe T. Kelly, deceased, late of Littleton, Colo., by La Verne S. Kelly, executrix, and Fred H. Poettmann, Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio

No Drawing. Filed Dec. 29, 1969, Ser. No. 888,900
Int. Cl. C10g *1/04*
U.S. Cl. 208—11 **13 Claims**

Oil from tar sands is extracted by contacting the tar sands with an oil-external micellar dispersion (contains 55–90% water), thereafter the sands are separated from

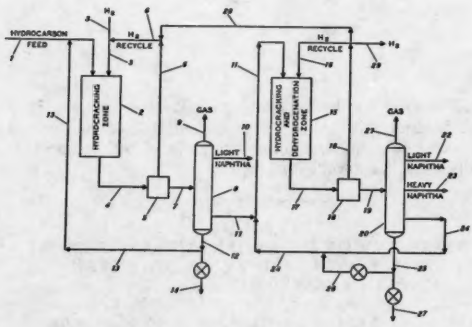
the micellar solution containing solubilized oil, and then the oil is recovered from the micellar dispersion. The micellar dispersion can be at a temperature in excess of 100° F. and the pH of the water within the dispersion can be about 7–14. Volume amounts of 0.5–30 volumes of micellar dispersion per volume of tar sand are useful with the process.

3,660,269
COAL PROCESSING
John C. McCauley, Philadelphia, Pa., assignor to Atlantic Richfield Company, New York, N.Y.
Filed Oct. 14, 1970, Ser. No. 80,661
Int. Cl. C10g *1/04*
U.S. Cl. 208—8 **6 Claims**



A coal hydrogenation process carried out in the absence of hydrogenation catalyst and in the presence of water.

3,660,270
TWO-STAGE PROCESS FOR PRODUCING NAPHTHA FROM PETROLEUM DISTILLATES
Harold F. Mason, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.
Continuation-in-part of application Ser. No. 763,603, Sept. 30, 1968. This application Jan. 15, 1970, Ser. No. 3,237
Int. Cl. C10g *23/00, 37/04*
U.S. Cl. 208—59 **5 Claims**

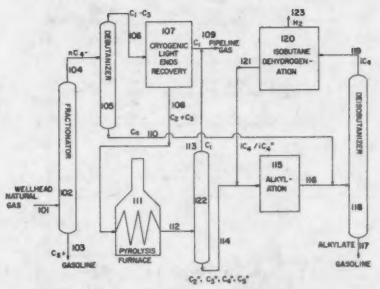


A hydrocarbon conversion process comprising hydrocracking a petroleum distillate in a first conversion zone, recovering at least one hydrocracked product, subjecting a portion of the effluent from said first conversion zone boiling generally above said hydrocracked product to hydrocracking and dehydrogenation in a second conversion zone without a net consumption of hydrogen, at a temperature in the range 825° to 950° F. and a pressure in the range 0 to 1500 p.s.i.g., and recovering at least one upgraded naphtha product from said second conversion zone.

3,660,271
SERIAL REFORMING WITH PLATINUM ON A NON ACIDIC SUPPORT AND PLATINUM-RHENIUM ON AN ACIDIC SUPPORT
Carl D. Keith, Summit, N.J. (% Engelhard Minerals & Chemicals Corporation, 429 Delancy St., Newark, N.J. 07105); George P. Masologites, Broomall, Pa.; and John Mooi, Homewood, Ill. (both % Atlantic Richfield Company, 400 E. Sibley Blvd., Harvey, Ill. 60426)
No Drawing. Filed Mar. 20, 1970, Ser. No. 21,548
Claims priority, application Canada, June 20, 1969, 54,898
Int. Cl. C10g *35/08, 39/00*
U.S. Cl. 208—65 **24 Claims**

A process for the catalytic reforming of naphthene and paraffin-containing hydrocarbons to improve their octane rating is disclosed which involves the use of a series of catalytic reaction zones of which one of the first contains a supported platinum group metal-containing, low acidity catalyst which is substantially devoid of rhenium and which serves to dehydrogenate naphthenes, and one of the last of which zones contains a supported platinum group metal and rhenium-containing catalyst of higher acidity which serves to dehydrocyclize paraffins.

3,660,272
GASOLINE PRODUCTION FROM WELLHEAD NATURAL GAS
George W. Frick, Hightstown, N.J., assignor to Cities Service Oil Company, Tulsa, Okla.
Filed Dec. 30, 1970, Ser. No. 102,687
Int. Cl. C10g *39/00*
U.S. Cl. 208—93 **5 Claims**



A process for the production of gasoline from wellhead natural gas is disclosed in which light hydrocarbon compounds found in wellhead natural gas are converted by an integrated process of operations into salable gasoline and natural gas principally composed of methane.

3,660,273
PRODUCTION OF IMPROVED LUBRICATING OILS BY HYDROCRACKING AND SOLVENT EXTRACTION
Billy H. Cummins, Nederland, Tex., assignor to Texaco Inc., New York, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 837,930, June 30, 1969. This application Nov. 12, 1969, Ser. No. 876,113
Int. Cl. C10g *41/00, 37/00*
U.S. Cl. 208—96 **6 Claims**

Lube oils of improved ultraviolet stability, color and viscosity index are obtained by hydrocracking a lube oil fraction and subjecting the product to solvent refining

the then dewaxing. The preferred solvent is N-methyl-2-pyrrolidone. The feed may be a wax distillate, a deasphalted residuum and may be subjected to pre-hydrocracking solvent refining step.

3,660,274
HYDROCARBON TREATING PROCESS
James J. Blazek, Reisterstown, and Richard W. Baker, Ellicott City, Md., and Charles P. Wilson, Jr., Cincinnati, Ohio, assignors to W. R. Grace & Co., New York, N.Y.
No Drawing. Continuation of application Ser. No. 686,725, Nov. 27, 1967. This application Feb. 18, 1970, Ser. No. 11,928
Int. Cl. C10g *11/04*
U.S. Cl. 208—120 **1 Claim**

A catalytic process of upgrading hydrocarbons which is characterized by contacting the hydrocarbons under reactive conditions with a catalyst having a low surface area matrix.

3,660,275
CYCLIC HYDROGENATION-REFORMING
Ralph A. Carey, San Anselmo, and Robert L. Jacobson, Pinole, Calif., assignors to Chevron Research Company, San Francisco, Calif.
No Drawing. Filed Oct. 2, 1969, Ser. No. 863,330
Int. Cl. C10g *35/08, 23/04*
U.S. Cl. 208—138 **1 Claim**

A process for alternately producing gasoline and jet fuel, in a reformer reactor containing a catalyst comprising platinum on alumina, by

(a) feeding a kerosene feedstock to the reformer reactor and hydrogenating the kerosene by contacting the kerosene with said catalyst in the presence of hydrogen at a temperature between 500° and 700° F., and at a relatively low pressure, for example, below 700 p.s.i.g.;
(b) preferably sweeping the catalyst bed with hot hydrogen;
(c) switching from a kerosene feed to the reformer reactor to a naphtha feed; and
(d) feeding a naphtha feedstock to the reformer reactor and contacting the naphtha with said catalyst at a temperature between 800° and 1100° F.

3,660,276
PURIFICATION OF HYDROCARBON OILS
John Aldwyn Lacey, Solihull, England, assignor to The Gas Council, London, England
Filed Mar. 20, 1969, Ser. No. 809,016
Claims priority, application Great Britain, Mar. 21, 1968, 13,738/68; Aug. 22, 1968, 40,252/68
Int. Cl. C10g *23/00, 31/14*
U.S. Cl. 208—212 **9 Claims**

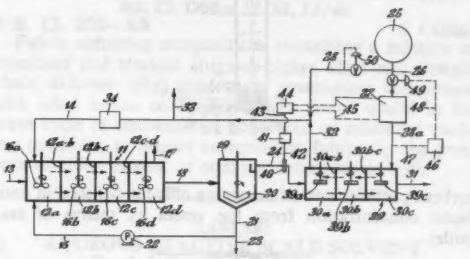
In a process for desulphurising hydrocarbon distillate oils, a mixture of the oil vapour and a carbon oxide-containing hydrogenating gas is passed over (a) a hydrodesulphurisation catalyst and then (b) a material capable of absorbing hydrogen sulphide and rapidly eliminating any carbonyl sulphide present either by absorbing the carbonyl sulphide or by converting it to hydrogen sulphide and absorbing the hydrogen sulphide.

The hydrogenating gas may be a lean gas, a town gas, a rich gas, or a substitute natural gas produced by steam reforming the desulphurised distillate oil.

The material used in stage (b) is preferably zinc oxide.

The process is capable of attaining a very high degree of purification (e.g. 0.2 p.p.m. or less). When a high degree of purification cannot be attained by use of a single pair of stages (a) and (b), the desired degree of purification can be attained by passing the mixture over (c) a zinc oxide-copper oxide composition or by repeating the stages (a) and (b).

3,660,277
OXYGENATION-OZONATION OF BOD-CONTAINING WATER
John R. McWhirter, Westport, Conn., and Ernest K. Robinson, West Liberty, W. Va., assignors to Union Carbide Corporation, New York, N.Y.
Continuation-in-part of abandoned application Ser. No. 52,196, July 7, 1970. This application May 17, 1971, Ser. No. 144,243
Int. Cl. C02c *1/06*
U.S. Cl. 210—6 **16 Claims**



BOD-containing water such as sewage is biochemically treated with oxygen and the liquid effluent is disinfected by chemical treatment with ozone while simultaneously fortifying the effluent with dissolved oxygen.

3,660,278
PROCESS FOR PREPARING SPECIALLY ACTIVATED SLUDGE
Akio Mimura, Tokyo, Takatsugu Kawano, Saitama, and Kanshi Yamaga, Tokyo, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha
No Drawing. Filed Apr. 15, 1969, Ser. No. 816,412
Claims priority, application Japan, Apr. 27, 1968, 43/27,978
Int. Cl. C02c *1/06*
U.S. Cl. 210—11 **8 Claims**

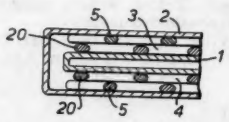
A process for preparing a specially activated sludge capable of being utilized in the biological treatment of waste waters containing poisonous substances, which comprises culturing in liquid media the screened microorganisms having properties of decomposing said poisonous substances contained in the chemical industry waste waters or in sewage waste waters, blending said cultured liquid of the microorganisms with an aqueous suspension of the usual activated sludge used in the treatment of the waste waters discharged from the food industries, fermentation industries, paper manufacturing industries, leather industries, etc. or in that of sewage or human excrements, and flowing continuously the aqueous solution containing said poisonous substances into the resulting blended liquid under aerobic conditions to force said microorganisms to combine with said usual activated sludge in commensal state.

3,660,279
METHOD FOR SORPTION OF ANTIBIOTICS FROM UNFILTERED LIQUIDS
Erik Hoff, Oslo, Norway, assignor to A/S Apothekernes Laboratorium for Specialpraeparater, Oslo, Norway
Filed Feb. 10, 1970, Ser. No. 10,183
Claims priority, application Norway, Feb. 12, 1969, 566/69
Int. Cl. C02b *1/80*
U.S. Cl. 210—19 **5 Claims**

A method for the sorption of an antibiotic from unfiltered liquids using at least one vessel having an inlet and an outlet from the liquids which comprises continuously feeding the unfiltered liquid into the vessel by means

of said inlet, oscillating the vessel containing the sorbent particles horizontally around its own axis to provide horizontal movement with minimal axial movement to the sorbent particles and withdrawing effluent reduced in antibiotic concentration from the vessel by means of said outlet.

3,660,280
DIALYSIS APPARATUS
George A. Rogers, Crewe, England, assignor to Calmic Engineering Company Limited, Crewe, England
Filed Apr. 23, 1969, Ser. No. 818,649
Claims priority, application Great Britain, Apr. 25, 1968, 19,761/68
Int. Cl. B01d *31/00, 13/00*
U.S. Cl. 210—22 11 Claims



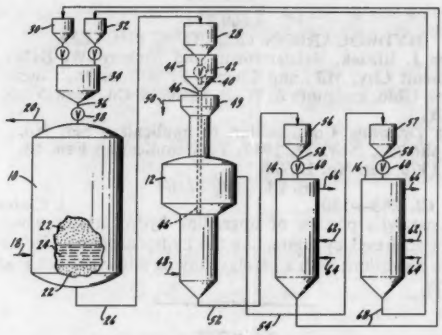
A dialysis system for removing toxic substances from the blood, provided with a dialysis membrane in the form of a semi-permeable flat member and a flat envelope within which the flat member is situated, and including a flexible lattice.

3,660,281
PERMEATION SEPARATION MEMBRANES
Frank William Tober, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed May 6, 1970, Ser. No. 34,948
Int. Cl. B01d *13/00*
U.S. Cl. 210—23 11 Claims

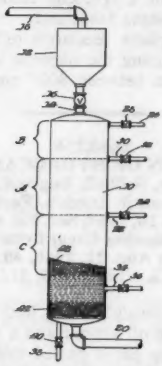
A membrane for the selective permeation separation of aqueous mixtures, which is a thin film or hollow filament of a linear aliphatic polyamide resin containing a hydrolyzable tannin.

3,660,282
METHOD AND APPARATUS FOR REGENERATING MIXED BEDS OF ION EXCHANGE RESINS
Dennis M. O'Brien, Chatham, N.J., assignor to Ecodyne Corporation, Chicago, Ill.
Filed June 17, 1969, Ser. No. 834,070
Int. Cl. B01d *15/06;* B01j *1/06*
U.S. Cl. 210—33 3 Claims

The invention provides an improved method and apparatus for delivering a mixture of anion and cation exchange resins to a separation column. In carrying out the method, resin is delivered rapidly from a metering zone to the transfer zone, and then is delivered from the transfer zone to the separation column at a relatively slow rate of speed. This two-step transfer minimizes undesirable disturbances in the separation column. In the apparatus, the metering and transfer zones are preferably defined by suitable hoppers located above the separation column.



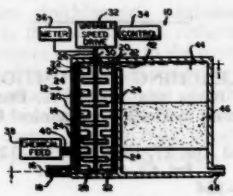
3,660,283
METHOD FOR REGENERATING CATION EXCHANGE RESIN
Leo F. Ryan, Somerville, N.J., assignor to Ecodyne Corporation, Chicago, Ill.
Filed Oct. 7, 1969, Ser. No. 864,347
Int. Cl. B01d *15/06*
U.S. Cl. 210—33 5 Claims



A method is provided for regenerating cation exchange resin containing insoluble sulfate-forming cations while preventing the formation of sulfate precipitates. In carrying out the method, sulfuric acid is introduced into a regeneration column at a regenerant inlet to establish a concentrated regenerant zone. Exhausted regenerant is withdrawn from the column at an outlet. In accordance with the invention, dilution water is introduced into the column between the regenerant inlet and the outlet to form a dilute regenerant zone. During regeneration, the resin passes first through the dilute regenerant zone, where it is partially regenerated. The resin is then further regenerated in the concentrated regenerant zone.

3,660,284
METHOD FOR WATER AND WASTEWATER TREATMENT

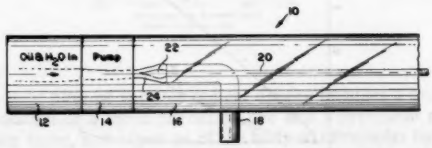
Thomas R. Camp, Boston, Mass., assignor of a fractional part interest to Walter J. Kreske, Newton Centre, Mass.
Continuation-in-part of abandoned application Ser. No. 828,552, May 28, 1969. This application Apr. 9, 1970, Ser. No. 26,954
Int. Cl. C02b 1/20
U.S. Cl. 210—49 9 Claims



Increasing the efficiency of continuous flow water and wastewater treatment plants by mixing the water or wastewater with a floc forming chemical in a first mixing stage at a speed effecting a mean velocity gradient corresponding to a flow volume concentration less than 300 parts per million until flocculation is substantially complete and then either passing it through a rapid filter or alternatively mixing it in a second mixing stage at a lesser speed effecting a velocity gradient corresponding to a selected effluent floc volume concentration greater than 300 parts per million before passing on to subsequent treatment such as settling and filtering.

3,660,285
METHOD OF SEPARATING FLUIDS HAVING DIFFERENT DENSITIES

Arthur L. Markel, Miami, Fla., assignor to Reynolds Sub-Marine Services Corporation, Miami, Fla.
Filed Nov. 6, 1970, Ser. No. 87,435
Int. Cl. B01d 12/00, 17/02
U.S. Cl. 210—65 12 Claims



Methods of separating fluids having different densities wherein the fluids are first separated by passing them through an axial flow pump. Thereafter, the flow diameters of the fluids are altered so that the flow diameter of one of the fluids is substantially equal to the internal diameter of a suitable extractor tube. In one embodiment of the invention, a mandrel having a tapered end is inserted into one of the fluids after it has been separated in a manner to increase its flow diameter to that of the internal diameter of an extractor tube. In another embodiment, an additional fluid, such as air, is injected into the fluids being monitored thereby increasing the flow diameter of the fluid to be collected to that of the internal diameter of an extractor tube. In another embodiment, an obstruction is inserted downstream from the axial flow pump thereby creating a venturi flow whereby the extractor tube may be positioned to remove substantially all of the desired fluid. In all embodiments, it is preferred to use a section of conduit downstream from the axial flow pump that is at least translucent whereby visual inspection permits the extractor tube to be positioned properly for maximum withdrawal efficiency.

3,660,286
LIQUID WASH CYCLE SOFTENER

Ralph Raymond Sepulveda, Suffern, N.Y., and Kenneth Fred Schoene, Palisades Park, N.J., assignors to Lever Brothers Company, New York, N.Y.
No Drawing, Filed Jan. 3, 1969, Ser. No. 788,918
Int. Cl. D06m 13/38, 13/46
U.S. Cl. 252—8.8 5 Claims

Fabric softening compositions containing a mixture of branched and straight chain di-higher alkyl and straight chain di-lower alkyl quaternary ammonium compounds with alkyl amine oxides have been found useful in the wash cycle of conventional household or industrial washing machines to impart softening to fabrics in the presence of either anionic or nonionic detergents or both.

3,660,287
AQUEOUS REACTIVE SCALE SOLVENT

Frank J. Quattrini, P.O. Box 1414, Midland, Tex. 79701
No Drawing. Filed Oct. 12, 1967, Ser. No. 674,730
Int. Cl. C02b 5/00
U.S. Cl. 252—8.55 B 13 Claims

An aqueous reactive scale solvent composition comprising basically a partially neutralized aminopolyacetic acid and a carbonate, such as, ammonium bicarbonate, has been found useful for the removal of scale by dissolving such deposits as calcium sulfate from oil well equipment, the porous and permeable zones of the reservoir rock, and from industrial equipment. The pH of the aqueous composition should be between 6.5 and 9.5 and preferably between a narrow range of 7.5 to 7.8, depending upon the temperature of the scale environment, e.g. the higher the temperature, the higher should be the pH of the solution.

3,660,288
GREASE COMPOSITIONS CONTAINING MAGNESIUM SALTS OF UNSATURATED FATTY ACIDS AS RUST INHIBITORS

Erling Hansen, Oakland, Calif., assignor to Chevron Research Company, San Francisco, Calif.
No Drawing. Filed Sept. 30, 1968, Ser. No. 763,920
Int. Cl. C10m 5/16, 5/20
U.S. Cl. 252—40.7 7 Claims

Grease compositions providing improved rust resistance comprising a major amount of an oil of lubricating viscosity, a minor amount, sufficient to thicken the oil to the consistency of a grease thickener, and a minor portion of a magnesium salt of an unsaturated unsubstituted or hydroxy-substituted fatty acid of 14 to 24 carbon atoms.

3,660,289
REACTION PRODUCT OF POLYAMINE AND CARBOXYLIC ACIDS, AND FUELS, LUBRICATING OILS, GREASES AND PLASTICS CONTAINING SAID PRODUCT

Henryk A. Cyba, Evanston, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Filed May 15, 1970, Ser. No. 37,941
Int. Cl. C10m 1/30, 1/32; C10l 1/22
U.S. Cl. 252—51.5 A 16 Claims

Reaction product formed by the condensation of a polyamine containing at least two primary and/or secondary nitrogens, polyhalopolyhydropolycyclicdicarboxylic acid or derivative and halogen-free dicarboxylic acid or derivative. In one embodiment the reaction product is used as an additive in hydrocarbon oils and lubricants. In another embodiment it is used as an additive in plastics.

3,660,290

LUBRICANT COMPOSITIONS

Roland T. Schlobohm, Bethalto, Ill., assignor to Shell Oil Company, New York, N.Y.

No Drawing. Filed Sept. 22, 1969, Ser. No. 860,035
Int. Cl. C10m *1/34*
U.S. Cl. 252—51.5 A **5 Claims**

4-alkylphenyl-1-alkyl-2-naphthylamines and mixtures of 4-alkylphenyl-1-alkyl-2-naphthylamines with 4-alkylphenyl-2-naphthylamines are effective in improving the oxidation resistance, cleanliness and bearing performance properties of lubricant compositions.

3,660,291

MAGNETO-OPTICAL ELEMENTS AND GLASSES

Guy E. Stong, Elmira, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Jan. 19, 1970, Ser. No. 3,872
Int. Cl. G02f *1/22;* **C03c** *3/04, 3/30*
U.S. Cl. 252—62.51 **8 Claims**

The invention relates to magneto-optical elements such as switches, modulators and isolators having very high Verdet constants. The elements are produced from glasses composed essentially of silica (SiO_2) as a glass former, a rare earth metal oxide as a primary modifier, and one or more stabilizing oxides selected from the group consisting of ZrO_2, TiO_2 and Nb_2O_5 as secondary modifiers.

3,660,292

FERRITE MATERIALS

Clement Bryce, Southport, England, assignor to U.S. Philips Corporation

No Drawing. Filed Sept. 17, 1970, Ser. No. 73,216
Claims priority, application Great Britain, Sept. 18, 1969, 46,049/69
Int. Cl. C04b *35/26, 35/36*
U.S. Cl. 252—62.6 **1 Claim**

High resistivity manganese-zinc-magnesium-copper ferrites for yoke ring applications. These ferrites have a composition expressed in mol. percent within the following ranges:

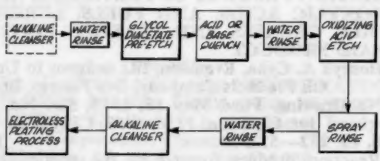
Fe_2O_3	33–39
MnO	20–32
ZnO	14–22
MgO	12–22
CuO	0.5–15

3,660,293

PRE-ETCH TREATMENT OF ACRYLONITRILE-BUTADIENE-STYRENE RESINS FOR ELECTROLESS PLATING

Eileen Maguire, San Gabriel, and Leon A. Kadison, Pasadena, Calif., assignors to Crown City Plating Co., El Monte, Calif.

Filed Sept. 23, 1969, Ser. No. 860,236
Int. Cl. B44d *1/092*
U.S. Cl. 252—79.4 **21 Claims**



Solutions containing glycol diacetate, particularly solutions containing glycol diacetate at concentrations close to solution saturation, are used as a pre-etch to improve the adhesion of metals to ABS resins in electroless plating processes.

3,660,294

METHOD OF CLEANING GLASS

Alexander Farkas, New York, N.Y., assignor to George Goda

No Drawing. Filed Aug. 31, 1970, Ser. No. 68,535
Int. Cl. C11d *7/54*
U.S. Cl. 252—100 **1 Claim**

A method of cleaning a glass surface by applying a mixture of ammonium persulfate and sulfuric acid to the surface and then rinsing the surface with water. The method leaves the glass free of agents which could interfere with subsequent analytical tests performed using the glassware.

3,660,295

BLEACHING COMPOSITIONS

Robert G. La Barge and Donald K. Bradley, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 27, 1970, Ser. No. 32,276
Int. Cl. C11d *7/54*
U.S. Cl. 252—104 **9 Claims**

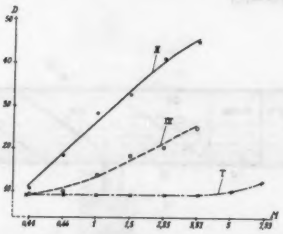
Disclosed herein are liquid bleaching compositions which when dispersed in water provide aqueous solutions having good oxidizing power. The aqueous solutions can be used, for example, to launder clothes. The bleaching compositions comprise an inorganic peroxygen compound dispersed in a carrier liquid. The carrier liquid also has a carboxylic acid anhydride dissolved therein.

3,660,296

DETERGENT AND ANTISEPTIC COMPOSITIONS COMPRISING A STOCK SOLUTION OF 3,4,4'-TRICHLOROCARBANILIDE AND PROCESS FOR THE PREPARATION OF THE STOCK SOLUTION

Maurice Lavril, Paris, France, assignor to Etablissements Clin-By la, Paris, France

Filed June 19, 1969, Ser. No. 834,637
Claims priority, application France, June 28, 1968, 157,133; July 5, 1968, 158,080
Int. Cl. C11d *3/48*
U.S. Cl. 252—106 **2 Claims**



Detergent and antiseptic composition comprising a stock solution of 3,4,4'-trichlorocarbanilide characterized in that the stock solution includes a solubilizing agent for 3,4,4'-trichluorocarbanilide compatible with a subsequent aqueous dilution.

3,660,297

LIQUID PAINT BOOTH DEFLOCCULANT

Thomas A. McCammon, Greenville, S.C., assignor to Morton-Norwich Products, Inc.

No Drawing. Filed Jan. 29, 1970, Ser. No. 6,951
Int. Cl. C11d *7/06, 7/12, 7/14*
U.S. Cl. 252—156 **4 Claims**

A paint booth deflocculant wash solution utilizing electro-positive lithium ions to precipitate the paint.

3,660,298

FURNACE CHARGE FOR USE IN THE PRODUCTION OF SILICON METAL

Richard J. McClincy, Lewiston, James H. Downing, Clarence, and Benjamin J. Wilson, Youngstown, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Nov. 19, 1969, Ser. No. 878,229

Int. Cl. C09k *3/00*; C01b *33/02*

U.S. Cl. 252—188.3 3 Claims

A low density stoichiometric agglomerated furnace charge for use in the carbothermic reduction of silica in electric type furnaces according to the overall reaction of $SiO_2+2C \rightarrow Si+2CO$. The charge comprises a fine fraction and a coarse fraction of particulated silica homogeneously mixed with a particulated carbon and a low density filler to provide an overall average bulk density of between about 20 and 50 pounds per cubic foot.

3,660,299

VARIABLE DENSITY LIGHT FILTERING MEANS UTILIZING LEUCO PHENAZINE DYES

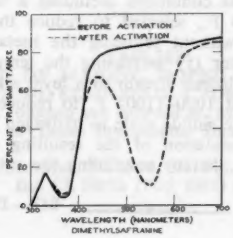
Richard J. Hovey, Sturbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Apr. 10, 1969, Ser. No. 814,955

The portion of the term of the patent subsequent to Oct. 29, 1985, has been disclaimed

Int. Cl. G02b *5/24*

U.S. Cl. 252—300 2 Claims



A light filter of variable optical density includes a body of solution of a leuco phenazine dye and a reversible reducing agent, and exposure of the body to ultraviolet light colorizes the leuco dye automatically varying the optical density of the body proportionally to the amount of ultraviolet light incident on the body.

3,660,300

METHOD OF PREPARING OXIDIZED RADON SOLUTIONS

Lawrence Stein, Downers Grove, Ill., assignor to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed June 5, 1970, Ser. No. 43,990

Int. Cl. C09k *3/00*

U.S. Cl. 252—301.1 R 5 Claims

A solution of nonvolatile, oxidized radon is prepared by reacting elemental radon with a fluoride-containing oxidant and dissolving the radon compound formed thereby in a suitable nonreducing, water-free solvent.

3,660,301

PROCESS FOR MAKING SILICA ORGANOSOLS

James F. Kovarik, Berwyn, and Peter H. Vossos, Lisle, Ill., assignors to Nalco Chemical Company, Chicago, Ill.

No Drawing. Filed Feb. 4, 1971, Ser. No. 112,813

Int. Cl. B01j *13/00*

U.S. Cl. 252—309 5 Claims

A method of preparing silica organosols which comprises: (1) dissolving a quaternary ammonium compound in a non-polar organic solvent; (2) adding an aqueous silica sol; (3) adding isopropanol; (4) thoroughly mixing; (5) separating the layers; and (6) removing the isopropanol by heat to recover the product.

3,660,302

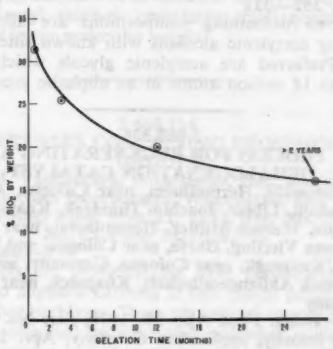
ANHYDROUS SILICIC ACID ORGANOSOLS

Milton E. Winyall, Ellicott City, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed May 27, 1968, Ser. No. 732,423

Int. Cl. B01j *13/00*

U.S. Cl. 252—309 9 Claims



A process for preparing non-aqueous organosols of low molecular weight silicic acid. Very stable organosols are obtained by adding freshly prepared acidic silica hydrosols to solvents which are strong electron donors and which are free of hydroxyl groups and unsaturation. After removal of water, the resultant anhydrous solutions are very stable and the dissolved silicic acid has an unusually low molecular weight.

3,660,303

AQUEOUS EMULSIONS

Armin Hiestand, Binningen, Switzerland, assignor to Ciba Limited, Basel, Switzerland

No Drawing. Filed Jan. 22, 1970, Ser. No. 5,147

Claims priority, application Switzerland, Jan. 27, 1969, 1,202/69

Int. Cl. B01j *13/00*

U.S. Cl. 252—311.5 13 Claims

Aqueous emulsions are provided which contain

(a) a methylolaminotriazine
(b) a waxy substance
(c) a water-soluble non-ionic polyethylene glycol compound and
(d) an alkylbenzenesulfonic acid salt.

In a dilute form, and additionally containing a curing catalyst, these emulsions serve for the production of wash-fast, water-repellent finishes on fiber materials.

3,660,304

METHOD OF PRODUCING OILY LIQUID-CONTAINING MICROCAPSULES

Hiroharu Matsukawa, Fujimiya-shi, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

No Drawing. Filed June 4, 1969, Ser. No. 830,539
Claims priority, application Japan, June 4, 1968, 43/38,087
Int. Cl. B01j *13/02*; B44d *1/02*
U.S. Cl. 252—316 21 Claims

A method for producing microcapsules including dissolving a hydrophobic, shell forming polymer in a low boiling point solvent, mixing the resulting solution in a water-insoluble high boiling point solvent which is a poor solvent for the polymer, emulsifying the mixture in an aqueous medium at a temperature below the boiling point of the low boiling solvent, and heating the emulsion to above the boiling point of the low boiling solvent, but below the boiling point of the high boiling solvent.

3,660,305

FOAM CONTROL IN LIQUID HYDROCARBONS

Raymond J. Michalski, Riverdale, Ill., assignor to Nalco Chemical Company, Chicago, Ill.

No Drawing. Filed June 6, 1968, Ser. No. 734,881
Int. Cl. B01d *17/00*
U.S. Cl. 252—321 8 Claims

Improved defoaming compositions are afforded by combining acetylenic alcohols with known silicone antifoams. Preferred are acetylenic glycols which contain from 8 to 18 carbon atoms in an aliphatic grouping.

3,660,306

PROCESS FOR REGENERATING A DEHALOGENATION CATALYST

Kurt Sennewald, Hermulheim, near Cologne, Alexander Ohorodnik, Liblar, Joachim Hundeck, Knapsack, near Cologne, Werner Mittler, Hermulheim, near Cologne, Hermann Vierling, Hurth, near Cologne, and Wolfgang Opitz, Knapsack, near Cologne, Germany, assignors to Knapsack Aktiengesellschaft, Knapsack, near Cologne, Germany

No Drawing. Filed Apr. 20, 1970, Ser. No. 30,334
Claims priority, application Germany, Apr. 24, 1969, P 19 20 806.1
Int. Cl. B01j *11/18, 11/02*
U.S. Cl. 252—415 5 Claims

A catalyst containing metallic palladium deposited on an acidproof carrier for use in the hydrogenation and dechlorination of dichloroacetic acid and/or trichloroacetic acid to produce monochloroacetic acid and/or acetic is regenerated. To this effect, the poisoned catalyst containing moisture in form of water and/or acetic acid and/or monochloroacetic acid is treated with chlorine gas in an acid medium, at temperatures of between 20 and 200° C., whereby the metallic palladium is oxidized to palladium chloride; residual chlorine is expelled by means of an inert gas; and the oxidized catalyst is successively treated with a reducing agent to re-effect reduction of the palladium chloride to metallic palladium.

3,660,307

PROCESS FOR REGENERATING FLUORINATION CATALYSTS OF THE CHROMOXY-FLUORIDE GROUP

Otto Scherer, Bad Soden, Taunus, Paul Peter Rammelt and Jürgen Korinth, Hofheim, Taunus, and Peter Frisch, Schwalheim, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Apr. 4, 1969, Ser. No. 813,692
Claims priority, application Germany, Apr. 11, 1968, P 17 67 200.3
Int. Cl. B01j *11/76, 11/02*
U.S. Cl. 252—415 5 Claims

Process for regenerating fluorination catalysts of the chromoxy-fluoride group, wherein hydrogen fluoride is passed over the catalyst at 100°–600° C. in an amount of at least 5 g. per liter of catalyst per hour. By the process the initial activity of said catalysts can be restored in an economic way.

3,660,308

IN SITU REGENERATION AND RESULFIDING OF A PLATINUM- AND SULFUR-CONTAINING CATALYST IN A HYDROCARBON CONVERSION PLANT CONTAINING METALLIC SULFIDE SCALE

John C. Hayes, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Continuation-in-part of application Ser. No. 663,988, Aug. 29, 1967. This application Mar. 12, 1970, Ser. No. 19,126
The portion of the term of the patent subsequent to Dec. 2, 1986, has been disclaimed
Int. Cl. B01j *11/02, 11/18*; C10g *35/08*
U.S. Cl. 252—416 8 Claims

A deactivated hydrocarbon conversion catalyst, comprising a combination of a platinum group component, a halogen component and a sulfur component with a porous carrier material, is regenerated and resulfided in situ in a hydrocarbon conversion plant that contains metallic sulfide scale by the steps of: (a) stripping sulfur from the catalyst with a hydrogen stream at conditions including a temperature of about 600–800° F., effective to remove sulfur from the catalyst while not substantially affecting the metallic sulfide scale (b) purging hydrogen from the plant (c) burning carbon from the catalyst at relatively low severity conditions, including an inlet temperature of about 650–850° F. (d) purging oxygen from the plant (e) circulating a sulfur-free hydrogen stream through the plant and into contact with the resulting oxidized catalyst at conditions including a temperature of about 600–800 F., selected to reduce the resulting oxidized catalyst without reducing the metallic sulfide scale; and thereafter (f) increasing the temperature of the circulating hydrogen stream to a level selected from the range of about 1000–1100° F. to reduce at least a part of the metallic sulfide scale to hydrogen sulfide and continuing the circulation of the resulting stream for at least one hour, thereby resulfiding the catalyst.

3,660,309

CATALYTIC COMPOSITE OF A PLATINUM GROUP COMPONENT AND A GROUP IV–A METALLIC COMPONENT WITH A CARRIER MATERIAL CONTAINING ALUMINA AND CRYSTALLINE ALUMINOSILICATE AND USES THEREOF

John C. Hayes, Palatine, Roy T. Mitsche, Island Lake, Richard E. Rausch, Mundelein, and Frederick C. Wilhelm, Arlington Heights, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed May 4, 1970, Ser. No. 34,539
Int. Cl. B01j *11/78, 11/40*
U.S. Cl. 252—442 22 Claims

A catalytic composite, comprising a platinum group component and a Group IV–A metallic component combined with a carrier material containing alumina and a finely divided crystalline aluminosilicate, is disclosed. A specific example of the catalytic composites disclosed herein is a composite containing 0.01 to 2 wt. percent platinum and 0.01 to 5 wt. percent germanium, combined with a gamma-alumina carrier material having 0.1 to 20 wt. percent of the hydrogen form of mordenite uniformly distributed therethrough. Principal utility of these catalytic composites is, broadly, in processes for the conversion of hydrocarbons and, more particularly, in a process for the production of LPG and a high octane reformate.

3,660,310

HYDROCARBON CONVERSION CATALYST

Harris E. Kluksdahl, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of application Ser. No. 729,079, May 14, 1968, now Patent No. 3,558,477, which is a continuation-in-part of application Ser. No. 639,719, May 19, 1967, now Patent No. 3,415,737, which in turn is a continuation-in-part of application Ser. No. 560,166, June 21, 1966. This application Nov. 19, 1969, Ser. No. 878,165

Int. Cl. B01j *11/58, 11/40*

U.S. Cl. 252—454 1 Claim

A hydrocarbon conversion catalyst comprising a crystalline zeolitic molecular sieve cracking component, 0.01 to 2.0 weight percent, based on said cracking component and calculated as the metal, of a hydrogenating component selected from platinum, palladium and iridium and compounds of platinum, palladium and iridium and 0.01 to 2.0 weight percent, based on said cracking component and calculated as the metal, of a hydrogenating component selected from the group consisting of rhenium and compounds of rhenium.

3,660,311

NOVEL FRAGRANCE METHODS AND COMPOSITIONS

Christian F. Wight, Mount Kisco, N.Y., assignor to International Flavors & Fragrances Inc., New York, N.Y.

No Drawing. Filed Jan. 9, 1970, Ser. No. 1,873

Int. Cl. A61k *7/00;* C11b *9/00*

U.S. Cl. 252—522 4 Claims

Processes for imparting fragrances to articles which comprise incorporating with such articles an effective amount of a polyalkylindanylpropanol, together with compositions for carrying out such processes and the products so obtained.

3,660,312

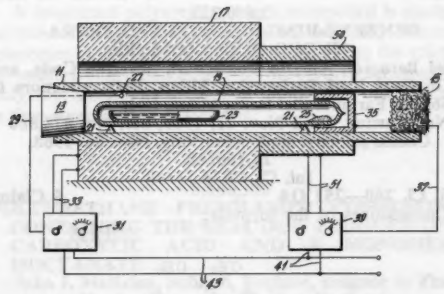
METHOD OF MAKING DOPED GROUP III–V COMPOUND SEMICONDUCTOR MATERIAL

Rowland E. Johnson and Edward W. Mehal, Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 21, 1960, Ser. No. 16,572

Int. Cl. H01b *1/06;* H01l *3/20*

U.S. Cl. 252—518 4 Claims



Method of making Group III–V compound semiconductor having the requisite impurity level for direct fabrication into tunnel diodes. In a reaction chamber, a high temperature zone containing a mixture of first element (e.g. gallium) and excess doping agent (e.g. zinc), and a low temperature zone containing excess second element (e.g. arsenic) are provided. The heating temperatures in the zones are controlled so that sufficient second element is vaporized and enough mixture of first element and doping agent are maintained above the melting point of the compound to assure reaction to give a stoichiometric melt of compound. A temperature gradient is established through said melt, and the temperature of the high temperature zone is lowered while maintaining said temperature gradient to freeze said melt progressively from one end.

3,660,313

HIGH FOAMING MIXTURES OF FATTY ALCOHOL SULFATES

William R. Axtell and Earl G. De Witt, Baton Rouge, La., assignors to Ethyl Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 2,670, Jan. 13, 1970, now Patent No. 3,598,747, which is a continuation-in-part of abandoned application Ser. No. 558,237, June 17, 1966, which in turn is a continuation-in-part of abandoned application Ser. No. 277,078, May 1, 1963, This application Nov. 19, 1970, Ser. No. 91,145

Int. Cl. C07c *141/04;* C11d *1/14*

U.S. Cl. 252—545 10 Claims

Higher alcohol sulfate compositions are disclosed which are primarily derivatives of mixtures of myristyl, palmityl, and stearyl alcohols containing small quantities of alcohols of lower molecular weight.

3,660,314

POLYETHERS CONTAINING PHOSPHINYL GROUPS

Edwin J. Vandenberg, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

No Drawing. Filed May 11, 1970, Ser. No. 36,452

Int. Cl. C08g *23/20, 43/02*

U.S. Cl. 260—2 A 11 Claims

Polyethers are provided that have phosphinyl groups attached to aliphatic carbons in side chains pendant from the polyether backbone. These phosphinyl containing polyethers are obtained by reacting a polyether containing a haloalkyl group, as for example, poly(epibromohydrin), with an organic phosphite, phosphonite or phosphinite. Said phosphinyl group has the general formula

$$-\overset{\overset{O}{\|}}{P}-(R')_x(OR)_{3-x}$$

where x is 0 to 2.

3,660,315

PROCESS FOR PREPARING FLUORINE-CONTAINING POLYMERS

James T. Hill, Wilmington, Del., and Michael E. Garabedian, Ringwood, N.J., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Sept. 22, 1970, Ser. No. 74,527

Int. Cl. C08g *23/14, 23/20*

U.S. Cl. 260—2 A 10 Claims

A process having beneficial utility in the manufacture of fluorine-containing polymers from HFPO (hexafluoropropylene oxide), especially useful for applications requiring difunctional polymer products that are substantially free of monofunctional polymer. The polymerization process employs a mixture of HFPO and a catalyst; the catalyst, which preferably is substantially free of cesium fluoride, is made up of a solution in an ethylene glycol ether of a particular organic compound containing both cesium and fluorine. The polymerization reaction zone is preferably at about −30 to −60° C., and it preferably contains hexafluoropropylene or the like as a solvent for the polymer.

3,660,316

POLYEPOXIDE BISUREA ADHESIVE COMPOSITION CONTAINING A 1 - CYANO - 3-(LOWER ALKYL) GUANIDINE AS AUXILIARY CURING AGENT

Frederic Charles Schaefer, Darien, and James Sterling Noland, Greenwich, Conn., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Nov. 20, 1970, Ser. No. 91,594

Int. Cl. C08g *30/14*

U.S. Cl. 260—2 N **6 Claims**

Compositions which consist essentially of an organic polyepoxide having at least two reactive 1:2-epoxy groups, a bisurea curing agent and a 1-cyano-3-(lower alkyl) guanidine as auxiliary curing agent for useful stability at room temperature yet thermoset at 180° F., making this composition specially useful as an adhesive for aluminum.

3,660,317

SPHEROIDALLY OR BEAD-SHAPED POROUS CONDENSATION-TYPE ION EXCHANGE PRODUCTS

Kishima Masatsugu, Kobe, Japan, assignor to C. Weinberger & Co., Ltd., Osaka-shi, Kita-ku, Japan

No Drawing. Continuation of application Ser. No. 774,504, Nov. 8, 1968. This application Nov. 3, 1970, Ser. No. 86,643

Claims priority, application Japan, Nov. 14, 1967, 42/18,142

Int. Cl. C08g *9/06*

U.S. Cl. 260—2.2 C **6 Claims**

Process of producing porous ion-exchange resin particles by forming a precondensate liquid mixture of a polyfunctional aldehyde, a phenol and an amine; incorporating a soluble filler material in such precondensate liquid; dispersing this mixture in a non-aqueous non-solvent liquid medium composed of a dialkyl phthalate higher than methyl and an alkyl chloride, preferably carbontetrachloride; condensating the precondensate in bead form during such agitation, completing the condensation by heat-treatment and then dissolving out the filler material to form a porous ion-exchange product.

3,660,318

ANTI-FLAME POLYSTYRENE COMPOSITION CONTAINING FLAME-RETARDING HALOGENATED COMPOUNDS

Akira Taniuchi, Kyoto, and Takuji Nakano, Suita, Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

No Drawing. Continuation-in-part of application Ser. No. 764,307, Oct. 1, 1968. This application Mar. 12, 1970, Ser. No. 19,068

Claims priority, application Japan, Oct. 23, 1967, 42/68,217; June 11, 1968, 43/40,121

Int. Cl. C08j *1/18*

U.S. Cl. 260—2.5 FP **18 Claims**

Novel halogenides of a reaction product of a phenol, alcohol, fatty acid. thiophenol or mercaptane with a glycidyl ether, glycidyl ester or glycidyl thioether and, if necessary, an alkylene oxide or alkylene sulfide are excellent flame-retarding agents for polystyrene and a polystyrene composition containing said halogenated compound is self-extinguishable and resistant to weather and discoloration with lapse of time.

3,660,319

TERTIARY POLYOXYALKYLENEPOLYAMINES

Ernest Leon Yeakey, Austin, Tex., assignor to Jefferson Chemical Company, Inc., Houston, Tex.

No Drawing. Continuation-in-part of application Ser. No. 803,934, Mar. 3, 1969. This application Dec. 8, 1970, Ser. No. 96,247

Int. Cl. C08g *22/44*

U.S. Cl. 260—2.5 AC **8 Claims**

New tertiary amines prepared from polyoxyalkylenepolyamines are useful catalysts for preparing urethane foams. The new tertiary amines are prepared by alkylation of the polyoxyalkylenepolyamine with an aldehyde and hydrogenation of the product.

3,660,320

DRY BLEND POLYVINYL CHLORIDE FOAM-FORMING COMPOSITION AND METHOD

Murdoch L. Johnson, Fort Lee, and Francis J. W. Bartlett, Wallington, N.J., assignors to The Flintkote Company, White Plains, N.Y.

No Drawing. Filed June 3, 1969, Ser. No. 830,149

Int. Cl. C08f *47/10, 45/40, 29/18*

U.S. Cl. 260—2.5 P **7 Claims**

A particulate, dry blend, vinyl chloride polymer-containing, foam-forming composition having improved foam-forming properties is disclosed. A mixture of vinyl chloride polymers having different molecular weights, e.g., relative viscosities of 1.4 to 2.6 and a relative viscosity difference of 0.003 to 0.7 is used, to provide a composition that is foamable over a relatively wide range of heating conditions to provide a greater degree of latitude in achieving desired combinations of cell structure and physical properties of the cellular material.

3,660,321

SHAPED ARTICLES COMPRISING SELF-EXTINGUISHING COMPOSITIONS OF PLASTICS AND MICROCAPSULES CONTAINING FLAME-ABATING COMPOUNDS AND PROCESS FOR PRODUCING THE SAME

Hans Eberhard Praetzel, Schubertstr. 3, Bensberg-Frankenforst, Germany, and Herbert Jenkner, Deutz-Kolker Str. 66, Cologne-Deutz, Germany

No Drawing. Filed Sept. 22, 1969, Ser. No. 860,010

Claims priority, application Germany, Sept. 30, 1968, P 17 94 271.1

Int. Cl. C08f *7/04;* C09k *3/28*

U.S. Cl. 260—2.5 FP **16 Claims**

Shaped articles of self-extinguishing compositions are produced by mixing a combustible plastic with microcapsules having a diameter of 5 to 5000 microns and containing a flame-abating compound for the plastic and forming a shaped article from the mixture, the mixing and forming being conducted under conditions such that the microcapsules are neither physically nor thermally ruptured and the flame-abating compound is retained in the microcapsule.

3,660,322

BENZENE-RING-SUBSTITUTED TETRAHYDRO-QUINAZOLINES

Luigi Bernardi, Alberto Bonsignori, Severina Coda, and Giselbert Karl Suchowsky, Milan, Italy, assignors to Societá Farmaceutici Italia, Milan, Italy

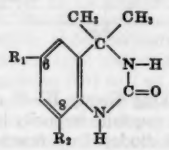
No Drawing. Filed Nov. 21, 1969, Ser. No. 878,880

Claims priority, application Italy, Nov. 26, 1968, 24,160/68

Int. Cl. C07d *51/48*

U.S. Cl. 260—251 QA **6 Claims**

Quinazolines of the formula:



wherein R_1 is selected from the group consisting of chlorine, bromine or nitro, and R_2 is selected from the

group consisting of hydrogen, chlorine, bromine or nitro. These compounds possess a central nervous system depressant activity.

3,660,323
PRESSURE SENSITIVE ADHESIVE MASS
Roger C. Raguse, Michigan City, Ind., assignor to The Scholl Mfg. Co., Inc., Chicago, Ill.
No Drawing. Filed Mar. 30, 1970, Ser. No. 24,003
Int. Cl. C08c *9/08*
U.S. Cl. 260—5 6 Claims

Pressure sensitive adhesive mass particularly useful for adhesive tapes, the mass including a blend of a polyisoprene, a polystyrene-polyisoprene-polystyrene block copolymer, natural rubber, and conventional additives in controlled amounts to provide an adhesive composition which evidences improved adhesion to the backing coupled with satisfactory physical properties in all other respects.

3,660,324
PROCESS FOR PRODUCTION OF CATIONIC SYNTHETIC RUBBER LATEX
Kotaro Onchi, Yokkaichi, Japan, assignor to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan
No Drawing. Filed Mar. 2, 1970, Ser. No. 15,902
Claims priority, application Japan, Mar. 8, 1969, 44/17,671
Int. Cl. C08c *7/18*; C08d *7/18*; C08f *47/18*
U.S. Cl. 260—17.5 8 Claims

A cationic surfactant comprising an adduct of ethylene oxide and an alkylamine and an ampholytic surfactant or lignin derivative are added to an ordinary anionic synthetic rubber latex and the pH of the latex is maintained within a certain range of about 7.5 to 2.0; a cationic synthetic rubber latex is obtained which is not diluted with a great amount of an aqueous medium and which is excellent in dispersion stability.

3,660,325
PREPARATION OF TOUGHENED POLYVINYL AROMATIC COMPOUND
Alexander McColl Bremner, Amberley, near Stroud, England, and John Mansel Squire, Dollar, Scotland, assignors to The British Petroleum Company Limited, London, England
No Drawing. Filed Feb. 25, 1970, Ser. No. 14,241
Claims priority, application Great Britain, Mar. 12, 1969, 13,009/69
Int. Cl. C08f *15/40, 19/08*
U.S. Cl. 260—17 R 5 Claims

A toughened polyvinyl aromatic compound is made by prepolymerising a solution of rubber and vinyl aromatic monomer until phase inverted and suspending the solution in water using a mixture of hydroxyethyl cellulose and polyvinyl alcohol as suspension stabilisers, Polymerisation is then completed in suspension.

3,660,326
POLYURETHANE PREPOLYMER COMPOSITION CONTAINING THE REACTION PRODUCT OF A CARBOXYLIC ACID AND A MONOMERIC ISOCYANATE
John J. Mallabar, Solihull, England, assignor to The Dunlop Company, London, England
No Drawing. Filed May 20, 1969, Ser. No. 826,263
Claims priority, application Great Britain, May 21, 1968, 24,074/68
Int. Cl. C08g *22/04*
U.S. Cl. 260—18 TN 14 Claims

A polyurethane prepolymer composition comprising a polyurethane prepolymer and the reaction product of a carboxylic acid with a monomeric isocyanate. Also the method for producing shaped articles which comprises forming into the desired shape and at least partially curing a foamable composition consisting of the polyurethane prepolymer composition plus a polyfunctional amine curative.

3,660,327
LACTONE OR LACTAM PRE-ESTERIFIED ISOCYANURATE-CONTAINING RESINS
Donald F. Loncrini and Henry J. Markowski, St. Louis, Mo., assignors to The P. D. George Company, St. Louis, Mo.
No Drawing. Filed June 8, 1970, Ser. No. 44,479
Int. Cl. C09d *3/70, 3/72*
U.S. Cl. 260—22 TN 40 Claims

Resins, including polyesters, polyester-amides, polyester-imides, polyester-amide-imides, etc., prepared from lactone or lactam pre-esterified isocyanurate derivatives (PEIC). These resins are preferably derived from hydroxyalkyl, such as hydroxyethyl, isocyanurates, and most preferably from tris(2-hydroxyethyl) isocyanurate or its equivalent, which has been pre-esterified with a lactone, a lactam or their equivalents.

These resins may be cured with curing agents for example triazine-aldehydes such as melamine-aldehydes, phenol-aldehydes, isocyanates, etc.

These resins may be employed in electrical insulation, particularly as wire enamels, electrical varnishes, etc. as well as for other uses.

3,660,328
DIELECTRIC FILMS
Claude A. Lindquist, Jr., Easton, Pa., assignor to Pfizer Inc., New York, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 697,934, Jan. 15, 1968, now Patent No. 3,551,197. This application July 27, 1970, Ser. No. 58,722
Int. Cl. C08g *17/16, 51/04*
U.S. Cl. 260—22 R 4 Claims

Dielectric films of high capacitance consisting of finely divided ceramic dispersed in water-insoluble organic resin matrix, and process for their manufacture.

3,660,329
WATER-REDUCIBLE PRINTING INK VEHICLE AND INKS MADE THEREFROM
John L. Wysocki, Hasbrouck Heights, N.J., assignor to Frye Industries Inc., New York, N.Y.
No Drawing. Filed May 7, 1969, Ser. No. 822,712
Int. Cl. C09d *11/10, 11/12*
U.S. Cl. 260—22 CQ 4 Claims

A water-reducible ink vehicle composition comprising, in its preferred aspect, an alkaline aqueous phase having dissolved therein a cross-linkable water-soluble polyester resin and one or more coupler solvents and further, having dispersed therethrough, finely-divided styrenated shellac and a wax. The ink vehicle composition can be employed per se as an overprint varnish or it can be pigmented with a wide variety of pigments to provide pigmented inks.

3,660,330
AQUEOUS ELECTRODIPPING LACQUER COMPOSITIONS
Rolf Dhein, Krefeld-Bockum, Hans-Jurgen Meibner, Krefeld, and Hermann Schnell, Krefeld-Uerdingen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed May 9, 1969, Ser. No. 823,494
Claims priority, application Germany, June 7, 1968, P 17 69 545.3
Int. Cl. C09d *3/64, 3/72, 5/24*
U.S. Cl. 260—22 TN 9 Claims

The invention relates to aqueous electrodipping lacquer compositions comprising water-dissolved amine salts of

alkyd resin semi-esters of tetrahydrophthalic acid or its homologues, said alkyd resin semi-esters being modified with saturated fatty acid radicals and with cross-linking N-alkoxymethyl groups and phenol and/or alkylphenols.

3,660,331

VINYL HALIDE RESINS STABILIZED WITH TETRAHYDROPYRANYL ESTERS AND ETHERS

Jerome H. Ludwig, Shaker Heights, Ohio, assignor to Emery Industries, Inc., Cincinnati, Ohio

No Drawing. Continuation-in-part of application Ser. No. 695,570, Jan. 4, 1968. This application Apr. 29, 1970 Ser. No. 33,048

Int. Cl. C08f *45/58*

U.S. Cl. 260—23 XA 17 Claims

Stabilization of vinyl halide and vinyl halide copolymer resin compositions against degradation by heat and the like by incorporating therein tetrahydropyranyl ethers or esters.

Vinyl halide resin stabilized compositions containing tetrahydropyranyl ethers or esters are employed in combination with metallic soaps, epoxidized fatty compounds, organic chelators and plasticizers. Effective and even synergistic stabilizing activities are demonstrated by the disclosed compositions.

3,660,332

PROCESS FOR PREPARING GRANULAR GRAFT COPOLYMERS

Kosaku Kamio, Motoyuki Kuwana, Atsushi Takahashi, and Masao Sahara, Uozu, Japan, assignors to Nippon Carbide Kogyo Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed Sept. 4, 1970, Ser. No. 69,971

Claims priority, application Japan, Sept. 5, 1969, 44/75,015

Int. Cl. C08f *47/02*

U.S. Cl. 260—23 XA 9 Claims

In a process for preparing a granular graft copolymer from a latex of graft copolymer produced by the emulsion graft polymerization of 70–5 parts of vinyl chloride onto 30–95 parts of an ethylene/vinyl ester copolymer through the salting-out, dehydrating and drying steps, the graft copolymer is heat treated at any step prior to the dehydrating step at a temperature of 60°–110° C. under the condition that the value (heating time)$^{1/2}$ × (heating temperature −30)^2 (min.$^{1/2}$. ° C.^{2}) falls within the range of 2,000 to 20,000 and the graft copolymer is dehydrated at a temperature lower than 60° C. but higher than 0° C. Thereby the graft copolymer can be dehydrated and dried much more conveniently than in the conventional processes, and the granular dry graft copolymer thus obtained causes far less odor of fatty acid during a long preservation or use compared to the conventional ones. Such improvements are promoted further by adding a Mg, Ca, Zn, Sr, Cd, Ba or Pb salt of a higher fatty acid to the graft copolymer at any step prior to the drying step.

3,660,333

WAX COMPOSITIONS CONTAINING AN ETHYLENE-VINYL ACETATE COPOLYMER, AN ORGANIC ACID AND A POLYVINYL ALKYL ETHER

Charles J. Kremer, Brookhaven, Pa., assignor to Atlantic Richfield Company, New York, N.Y.

No Drawing. Filed July 22, 1969, Ser. No. 843,787

Int. Cl. C09d *3/44*

U.S. Cl. 260—23 H 14 Claims

This invention relates to wax compositions containing a wax, an ethylene-vinyl acetate copolymer, an acid component and a polyvinyl alkyl ether. Most preferably the polyvinyl alkyl ether is either polyvinyl methyl ether or polyvinyl isobutyl ether. These compositions have highly improved resistance to stress cracking and improved seal strength. They can be utilized as hot melt coatings for items such as paperboard and corrugated board for use in the packaging industry and particularly as pressure sensitive adhesive coatings.

3,660,334

STRIPPABLE WAX COATING COMPOSITIONS

Dominic Apikos, Park Forest, Ill., assignor to Atlantic Richfield Company, New York, N.Y.

No Drawing. Original application June 10, 1966, Ser. No. 556,555, now Patent No. 3,518,215, dated June 30, 1970. Divided and this application Jan. 12, 1970, Ser. No. 2,383

Int. Cl. C08f *45/52*

U.S. Cl. 260—28.5 13 Claims

This invention relates to a strippable wax coating containing an ethylene-vinyl acetate polymeric composition and a stripping agent which is either an N-substituted fatty acid amide or a nitrogen containing compound containing a fatty acid residue. Particularly preferred are wax compositions which contain as the stripping agent an N-substituted fatty acid amide containing a fatty acid residue having from 10 to 17 carbon atoms. The composition can also contain minor amounts of a mineral oil to increase the strippability.

3,660,335

PETROLEUM WAX BLENDS

Charles D. Mason, Florham Park, and Julius P. Rakus, Basking Ridge, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed June 21, 1966, Ser. No. 559,113

Int. Cl. C08f *45/52*

U.S. Cl. 260—28.5 1 Claim

Blends of petroleum wax with (1) from 1 to 20 wt. percent of polybutene-1 having an average molecular weight of about 50,000 to 1,000,000 and an isotactic content of about 50 to 98 wt. percent, and (2) from 1 to 20 wt. percent of an ethylene/vinyl acetate copolymer containing from about 10 to 40 wt. percent vinyl acetate have improved tensile strength, hardness, softening points and gloss, without markedly increased viscosity or shrinkage, and have cloud points not appreciably higher than that of the petroleum wax constituent. These blends are particularly useful as coatings for paper, paperboard and the like.

3,660,336

PROCESS FOR BLENDING HIGH MOLECULAR WEIGHT POLYETHYLENE INTO WAX, AND WAX COATING COMPOSITION PRODUCED THEREFROM

Stewart J. Gonta, Marina Del Rey, and Thomas Hallis, Jr., and Lawrence S. Johnson, Brea, Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

No Drawing. Continuation-in-part of abandoned application Ser. No. 680,975, Nov. 6, 1967. This application Nov. 27, 1970, Ser. No. 93,032

Int. Cl. C08f *45/52*

U.S. Cl. 260—28.5 6 Claims

Low concentrations of high molecular weight, high density polyethylenes are incorporated into wax compositions used for coatings. A stable colloidal dispersion of the polyethylene is prepared by blending the same in powdered form into the wax at below the congealing temperature of the polymer, and then heating the wax-polymer blend until the polymer melts. The properties of the wax coating combine high viscosity with adhesion and gloss at a lowered cost of the polymeric additive.

3,660,337
THERMOSTABLE RESINS AND THEIR PRODUCTION
Maurice Balme and Maurice Ducloux, Rhone, France, assignors to Rhone-Poulenc S.A., Paris, France
No Drawing. Filed July 8, 1968, Ser. No. 743,016
Claims priority, application France, July 13, 1967, 114,383
The portion of the term of the patent subsequent to Feb. 1, 1989, has been disclaimed
Int. Cl. C08g *25/00*
U.S. Cl. 260—29.2 9 Claims

Thermostable resins are made by dissolving in ammonia a polycondensation product of a monophenol or polyphenol with a polyanhydride, a corresponding polyacid, evaporating the solution to dryness, and heating the residue.

3,660,338
AMPHOTERIC STRENGTHENING AGENTS FOR PAPER
Peter Economou, Bedford, Mass., assignor to American Cyanamid Company, Stamford, Conn.
No Drawing. Continuation-in-part of abandoned application Ser. No. 546,214, Apr. 29, 1966. This application July 22, 1969, Ser. No. 843,838
Int. Cl. C08f *45/24*
U.S. Cl. 260—29.6 NR 14 Claims

Normally liquid water-insoluble polysalt coacervates, wherein one of the component polymers is only weakly ionic, are water-soluble where they contain a sufficient amount of an ionization suppressor.

3,660,339
LATEX THICKENER
Theodore R. Schuh, Jr., North Riverside, Ill., assignor to Nalco Chemical Company, Chicago, Ill.
No Drawing. Filed June 3, 1969, Ser. No. 830,098
Int. Cl. C08d *7/14*
U.S. Cl. 260—29.7 D 3 Claims

A latex composition comprising a colloidal aqueous emulsion of a polymer and 0.1–5% by weight, based on dry latex, of a thickening agent.

The thickening agent is prepared by reacting a maleic anhydride copolymer with a polyalkylene glycol in a mole ratio of .001:1 to 0.1:1.

3,660,340
HALOGENATED HYDROCARBON MATERIALS AS TACKIFIERS FOR SYNTHETIC RUBBERS
Sung Ki Lee, Niagara Falls, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.
No Drawing. Filed Nov. 30, 1966, Ser. No. 597,878
Int. Cl. C08c *11/24*; C08d *13/30*
U.S. Cl. 260—31.8 HA 17 Claims

Tackifying agents for rubbers, especially ethylene-propylene (EPDM and EPR) type rubbers, can be prepared by treating paraffinic and/or aromatic hydrocarbon process oils having at least ten carbon atoms with an alkylating or acylating or halogenating agent. Four methods of preparataion are given: (1) reaction of the hydrocarbon oil directly with an alkylation or acylation agent, such as polychlorinated benzyl chloride, in the presence of a Lewis acid, (2) halogenation of the hydrocarbon oil, (3) modification of a halogenated hydrocarbon oil into an alkylating agent, such as by treatment with chloromethyl ether in the presence of a Lewis acid, and then further reacted with a hydrocarbon oil, and (4) alkylation or acylation of a hydrocarbon oil, such as by treatment with benzyl chloride in the presence of a Lewis acid, and followed by halogenation.

3,660,341
HEAT STABLE POLYURETHANE SOLUTIONS
Kornelius Dinbergs, North Royalton, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.
No Drawing. Filed Nov. 3, 1969, Ser. No. 873,514
Int. Cl. C08g *51/44, 51/58*
U.S. Cl. 260—32.6 N 5 Claims

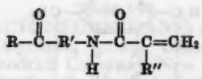
Solutions of polyurethane are stabilized by the addition of an organic halogen-containing compound such as ethyl iodide. These stabilized solutions are protected against severe degradation on aging, even at high temperatures.

3,660,342
PREPARATION OF 1,3-DIENES
John C. Duggan, Chicago, Ill., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Dec. 22, 1970, Ser. No. 100,784
Int. Cl. C07c *3/10*
U.S. Cl. 260—666 A 3 Claims

The invention relates to the preparation of 1-vinylcyclohexene and other 1,3-dienes by an isomerization and pyrolysis process.

3,660,343
ADHESIVE DENTAL FILLING MATERIAL AND METHOD OF USING THE SAME
Jacob A. Saffir, Los Angeles, Calif., assignor to Dentsply International, Inc., York, Pa.
No Drawing. Filed June 17, 1970, Ser. No. 47,159
Int. Cl. C08g *51/04, 33/10*
U.S. Cl. 260—37 EP 6 Claims

A color stable adhesive dental composition particularly adapted for use as a dental filling material for posterior and anterior teeth comprising a dentally acceptable thermosetting epoxy resin hardened with from about 2% to about 50% by weight, based on the weight of the epoxy resin of an N-3-oxohydrocarbon-substituted acrylamide of the formula



wherein R and R'' are each independently selected from hydrogen and lower alkyl radicals and R' is selected from ethylene and lower alkyl substituted ethylene radicals. Such color stable dental composition preferably comprises about 17 to about 70% by weight of such hardened dentally acceptable epoxy resin and from about 10 to about 83% by weight of a finely divided ceramic filler. Due to the esthetic resemblance in color to dental enamel such adhesive dental composition can be utilized to fill both anterior and posterior teeth without the need for any special retentive means.

3,660,344
SELF-EXTINGUISHING POLYAMIDE MOULDING COMPOSITIONS
Dietrich Michael, Kresfeld-Bockum, and Wilfried Kosiol, Moers, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Continuation of abandoned application Ser. No. 804,262, Mar. 4, 1969. This application Mar. 29, 1971, Ser. No. 129,206
Int. Cl. C08g *51/10, 51/58*
U.S. Cl. 260—37 N 5 Claims

Self-extinguishing polyamide moulding compositions containing as a flame retardant agent melamine, a derivative of melamine or the melamine condensation product melam.

3,660,345
ORGANOPOLYSILOXANE ELASTOMER COMPOSITIONS

William Joseph Bobear, Latham, N.Y., assignor to General Electric Company

No Drawing. Filed Sept. 9, 1968, Ser. No. 758,575
Int. Cl. C08f *11/04;* C08g *31/02*
U.S. Cl. 260—37 SB 10 Claims

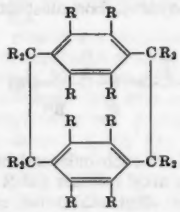
Organopolysiloxane compositions are provided which are convertible to elastomers having high tear strength and resiliency comprising either a two component blend of a vinyl containing organopolysiloxane gum having minor amounts of chemically combined siloxy units with at least one vinyl radical attached to silicon, and a vinylpolysiloxane having up to major amounts of chemically combined siloxy units with at least one vinyl radical attached to silicon, or a three component blend comprising an organopolysiloxane gum free of chemically combined siloxy units with at least one vinyl radical attached to silicon in combination with the aforementioned two component blend.

3,660,346
FLAME-RETARDED COMPOSITIONS AND ADDITIVE SYSTEMS THEREFOR

Roy A. Gray and Harold R. Deck, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed Aug. 14, 1970, Ser. No. 63,915
Int. Cl. C08k *1/24;* C09k *3/28*
U.S. Cl. 260—41 10 Claims

Fire-retardant compositions of normally flammable organic materials are provided by admixing with said materials an additive system consisting essentially of (A) at least one bromine-containing organic compound having a bromine content of at least 30 weight percent, (B) at least one paracyclophane compound of the formula



wherein each R is selected from hydrogen, chlorine, bromine and alkyl radicals having 1 to 4 carbon atoms, and optionally (C) antimony trioxide.

3,660,347
FILM FOR PROTECTING A VEHICLE BOTTOM PLATE

Gerhard Hermann Wendler, Schwetzingen, and Gunther Heinz Minet, Heidelberg, Germany, assignors to Teroson Werke G.m.b.H., Heidelberg, Germany

No Drawing. Filed Feb. 17, 1970, Ser. No. 11,941
Int. Cl. C08f *45/08;* B32b *3/00*
U.S. Cl. 117—8 3 Claims

The bottom plate and other parts of a vehicle are protected from corrosion and road materials by applying a film comprised of 10 to 40 percent of an ethylene copolymer, 90 to 60 percent of inorganic fillers, and optionally up to 20 percent of a plasticizer and up to 10 percent of a vinyl resin to impart special properties. The film is self-supporting and has a specific density of 1.5 to 3.0 g./cm.^{3}. The film is in the form of a sheet or shaped to the contour of the surface to which it is to be attached by adhesive or melt bonding.

3,660,348
COATING COMPOSITIONS BASED ON VINYL POLYMERS

Roger Garnier, Lyon, Roger Hogenmuller, Sainte-Foy-les-Lyon, and Jacques Massebeuf, La Sarranziniere, France, assignors to Rhone-Poulenc S.A., Paris, France

No Drawing. Filed Mar. 5, 1969, Ser. No. 804,665
Claims priority, application France, Mar. 6, 1968, 142,608
Int. Cl. C08f *45/28*
U.S. Cl. 260—41 5 Claims

Polymers of vinyl esters of certain branched chain aliphatic monocarboxylic acids, alone or with a proportion of other vinyl esters as comonomers, dissolve in aliphatic hydrocarbons to give solutions useful in paints.

3,660,349
DISPERSANTS FOR ORGANIC SOLVENT SYSTEMS

Thomas D. Mutaffis, Springfield, Leon Katz, Midland Park, and Frederick Grosser, North Plainfield, N.J., assignors to General Aniline & Film Corporation, New York, N.Y.

No Drawing. Continuation of application Ser. No. 610,240, Jan. 19, 1967. This application Feb. 25, 1970, Ser. No. 14,756
Int. Cl. C08f *45/04, 45/14, 48/28*
U.S. Cl. 260—41 4 Claims

This invention is directed to a free-flowing colorant paste dispersion of high solids comprising a colorant, preferably oil-soluble pigments or dyestuffs, and as the dispersant, an alkylated polymer of a heterocyclic N-vinyl monomer and a hydrocarbon liquid medium having a Kauri Butanol Value of less than about 45.

3,660,350
FLAME RETARDANT THERMOPLASTIC POLYMERS

Bernard G. Kushlefsky, Edison, N.J., assignor to M & T Chemicals Inc., Greenwich, Conn.

No Drawing. Filed May 7, 1971, Ser. No. 141,387
Int. Cl. C08f *45/56;* C08g *51/56*
U.S. Cl. 260—45.75 R 6 Claims

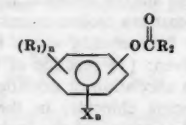
The drastic reduction in flame-retardant properties that occurs when polymer compositions containing organic phosphine oxides are processed at elevated temperatures is substantially eliminated when the phosphine oxides are present as complexes with selected Lewis acids.

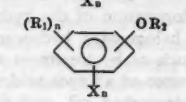
3,660,351
FLAME RESISTANT ACRYLONITRILE POLYMERS

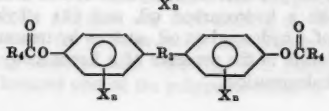
Richard Frederick Schmidt, Stamford, and Joseph Jacinto Pellon, New Canaan, Conn., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Mar. 12, 1970, Ser. No. 19,124
Int. Cl. C08f *45/58*
U.S. Cl. 260—45.85 8 Claims

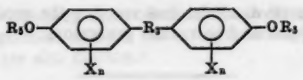
An acrylonitrile polymer such as an acrylonitrile fiber having improved flame resistance contains a halogenated aromatic compound having the formula

(1) 

(2) 

(3) 

(4)



or

(5)

wherein R_1 is hydrogen, chlorine, bromine or an alkyl radical having from 1 to 9 carbon atoms, R_2 is an alkyl radical having 1 to 22 carbon atoms and the sum of the carbon atoms of R_1 and R_2 is greater than 9, R_3 is methylene, isopropylidene, oxygen or sulfur; R_4 is an alkyl radical containing at least one carbon atom; R_5 is a 2,3-dibromopropyl group; X is bromine or chlorine; *m* is an integer of from 0 to 22 and *n* is an integer of from 0 to 4 with the proviso that each formula contains at least two aromatically bound halogen atoms.

3,660,352

HINDERED PHENOL SULFIDE ANTIOXIDANTS FOR POLYMERS

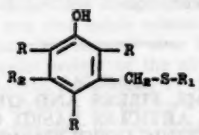
John Song, Bound Brook, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of application Ser. No. 705,624, Feb. 15, 1968. This application June 4, 1970, Ser. No. 43,594

Int. Cl. C08c *27/66;* **C08f** *45/58;* **C08g** *51/58*

U.S. Cl. 260—45.95 **6 Claims**

Compounds of the type represented by the formula:



wherein each R is independently a lower alkyl group, R_1 is higher alkyl or higher alkylbenzyl, R_2 is hydrogen or the group $—CH_2SR_1$, and their use as effective antioxidants for organic materials normally subject to oxidative deterioration, especially polyolefins.

3,660,353

MONOMERS AND POLYMERS OF 10-(ALKENYL) OXYPHENOXARSINES

Chun-Shan Wang and David P. Sheetz, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Apr. 1, 1970, Ser. No. 24,818

Int. Cl. C07d *105/06;* **C08f** *3/62, 15/02*

U.S. Cl. 260—47 UA **16 Claims**

10-(alkenyloxy)phenoxarsine monomers and certain homopolymers, and interpolymers of certain 10-(alkenyloxy)phenoxarsines with copolymerizable ethylenically unsaturated compounds are disclosed as novel compounds useful as herbicides and as antimicrobial agents for the control of a wide variety of fungal and bacterial organisms.

3,660,354

QUATERNARY AMMONIUM AND PHOSPHONIUM THIOCYANATES AND THEIR USE AS ACCELERATORS FOR EPOXY RESINS

Heinz Uelzmann, Cuyahoga Falls, Ohio, assignor to The General Tire & Rubber Company

No Drawing. Filed Aug. 13, 1969, Ser. No. 849,924

Int. Cl. C08g *30/12*

U.S. Cl. 260—47 EC **13 Claims**

Quaternary ammonium and phosphonium thiocyanates have been found to accelerate the curing of epoxy-amine or epoxy-anhydride systems effectively. Since these compounds are free of protons, they are especially useful for epoxy-anhydride adhesives. These accelerators can also be used in conjunction with known accelerators, such as tertiary amines.

3,660,355

THERMOSET MOLDING POWDERS FROM HYDROXY-FUNCTIONAL ACRYLIC RUBBER PARTICLES AND MONOBLOCKED DIISOCYANATES AND MOLDED ARTICLE

Olin B. Johnson, Livonia, and Santokh S. Labana, Dearborn Heights, Mich., assignors to Ford Motor Company, Dearborn, Mich.

No Drawing. Filed Dec. 21, 1970, Ser. No. 100,459

Int. Cl. C08g *22/00*

U.S. Cl. 260—77.5 CR **22 Claims**

Novel thermosetting resin powders which can be molded to form unique, urethane-crosslinked, elastomer-comprising products are prepared by reacting hydroxy-functional, elastomeric, acrylic polymer particles with a monoblocked diisocyanate. These powders are molded by conventional molding techniques to form unique thermoset products.

3,660,356

POLYESTER AMIDE ELASTOMERS CONTAINING POLYETHER UNITS

Eduard Radlmann, Lothar Ruetz, and Gunther Nischek, Dormagen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Apr. 23, 1970, Ser. No. 31,408

Claims priority, application Germany, Apr. 29, 1969, P 19 21 738.0

Int. Cl. C08g *20/30*

U.S. Cl. 260—75 N **11 Claims**

High molecular weight linear polyester amide elastomers obtained by polycondensing amide groups containing dicarboxylic acid esters, optionally together with normal dicarboxylic acid esters, with linear aliphatic polyether diols. The elastomers are processable to obtain films and fibers.

3,660,357

POLY(LACTONEURETHANE) ADHESIVES

Edmond G. Kolycheck, Lorain, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 664,950, Sept. 1, 1967. This application Oct. 12, 1970, Ser. No. 80,156

Int. Cl. C08g *22/06*

U.S. Cl. 260—77.5 AN **5 Claims**

Polyurethanes prepared from poly(epsilon-caprolactones) having molecular weights from about 1800 to about 2200, less than one mol of an aliphatic glycol and certain aromatic diisocyanates form adhesive materials which are soft and tacky when heated but which on aging harden and crystallize to form tough, crystalline but flexible, bonding agents having good adhesive properties. The poly(lactoneurethanes) are particularly adaptable to providing articles adhered together with excellent structural stability.

3,660,358

PROCESS FOR PRODUCING POLYESTERS AND SHAPED ARTICLES RESPECTIVELY MADE FROM THESE POLYESTERS

Josef Hrach and Theodor Wimmer, Tyrol, Austria, assignors to Sandoz Ltd., Basel, Switzerland

No Drawing. Filed Nov. 12, 1968, Ser. No. 775,176

Claims priority, application Austria, Nov. 21, 1967, 10,487/67; Dec. 1, 1967, 10,865/67

Int. Cl. C08f *17/013*

U.S. Cl. 260—75 R **6 Claims**

Polyesters of dicarboxylic acids and diols, more particularly, polyethylene terephthalate, are prepared by reacting the selected starting materials in the presence of a metallic catalyst consisting of (a) antimony, (b) at least one member selected from the group consisting of lead

and tin, and (c) an alkali metal in amounts of from 0.005 to 1% by weight based upon the amount of carboxylic acids in the process. These polyesters are particularly suitable for the production of shaped articles including fibers, filaments and films.

3,660,359

THERMOSET RESINS WITH HYDROXY ACRYLATE, METHACRYLONITRILE AND BLOCKED ISOCYANATE

Santokh S. Labana, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed June 5, 1970, Ser. No. 43,893
Int. Cl. C08q *22/06*
U.S. Cl. 260—77.5 CR 18 Claims

Novel thermosetting resin powders which can be molded to form products characterized in tensile measurement, by high elongation-to-break, high tensile strength and modulus and a high glass transition temperature are prepared from a mixture of (a) a prepolymer formed by reacting (1) a hydroxy ester of acrylic or methacrylic acid and a C_2–C_3 diol with (2) methacrylonitrile or acrylonitrile or a mixture of the same, and (b) blocked di- or triisocyanate wherein the isocyanate groups are directly attached to an aromatic ring and deblock at temperatures in the range of 120° to 160° C.

3,660,360

WATER- AND OIL REPELLENCY AGENTS

Dilip K. Ray-Chaudhuri and Carmine P. Iovine, Somerset, N.J., assignors to National Starch and Chemical Corporation, New York, N.Y.

No Drawing. Filed June 24, 1970, Ser. No. 49,537
Int. Cl. C08f *15/38, 29/38, 37/00*
U.S. Cl. 260—78.5 E 12 Claims

Fluoroalkyl - alkoxyalkyl acrylates and methacrylates comprising the reaction product of a perfluoroalkoxyalkyl alkanol and an acrylic or methacrylic acid reagent. The resulting monomers may, thereafter be homo- or copolymerized with a wide variety of conventional ethylenically unsaturated, i.e. vinyl, monomers, said polymeric materials imparting both water and oil repellency to a wide variety of substrates.

3,660,361

HIGHLY ORDERED AZO-AROMATIC POLYAMIDES

Hartwig C. Bach, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 789,072, Jan. 2, 1969. This application Sept. 28, 1970, Ser. No. 76,284
The portion of the term of the patent subsequent to Mar. 17, 1987, has been disclaimed
Int. Cl. C08g *20/20, 20/22*
U.S. Cl. 260—78 R 12 Claims

Linear polyamides derived from aromatic diacid halides and diamines containing azo linkages and asymmetrical aromatic radicals have been found to have thermal, mechanical and electrical properties attractive for use of the polyamides in the manufacture of fibers, films and other shaped articles.

3,660,362

PRODUCTION OF POLYMERS HAVING LOW COLD FLOW PROPERTIES

Richard L. Smith and Carl A. Uraneck, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed June 18, 1970, Ser. No. 47,632
Int. Cl. C08g *23/00*
U.S. Cl. 260—79 8 Claims

A method of altering the cold flow properties of polymers by reacting linear metal-terminated polymers with cyclic aromatic disulfides and reacting the product thereof with oxygen or free radical generators.

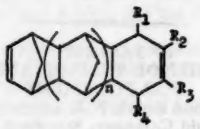
3,660,363

VULCANISABLE COPOLYMERS

Richard Gregory Foster and Paul Hepworth, Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed July 20, 1970, Ser. No. 56,668
Claims priority, application Great Britain, July 22, 1969, 36,828/69
Int. Cl. C08f *15/40*
U.S. Cl. 260—80.78 12 Claims

An amorphous high molecular weight vulcanisable copolymer of ethylene, at least one α-olefin having from 3 to 8 carbon atoms, and at least one polycyclic diene having the structure



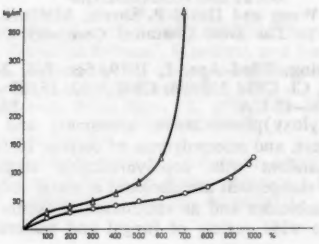
where n is a whole number of at least one and each of R_1, R_2, R_3 and R_4 is either a hydrogen atom or a monovalent hydrocarbyl group, or hydrocarbyl derivatives of said polycyclic diene.

3,660,364

ELASTIC FILMS, FIBERS AND OTHER MANUFACTURED ARTICLES BASED ON UNSATURATED OLEFINIC COPOLYMERS

Paolo Longi, Alberto Valvassori, and Francesco Greco, Milan, and Ermanno Bernasconi, Caronno Varesino, Varese, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Filed Apr. 2, 1969, Ser. No. 812,663
Int. Cl. C08f *15/40, 5/00*
U.S. Cl. 260—80.78 8 Claims



These are disclosed elastic manufactured articles, including elastic fibers and films based on unsaturated, vulcanizable copolymers of ethylene, at least one branched alpha-olefin, hydrocarbon monomers containing at least two double bonds and, optionally, propylene, which copolymers are amorphous in the relaxed state but crystallizable by stretching. The copolymers must contain, by moles, 70–90% of polymerized ethylene, 1–29% of polymerized branched alpha-olefin, 0.05–3% of the polymerized hydrocarbon monomer containing at least two double bonds, and 0–28% of polymerized propylene. Methods for obtaining the copolymers using catalysts

based on vanadium compounds and metallorganic aluminum compounds, and for effectively cross-linking the copolymers are also disclosed.

3,660,365

PRODUCTION OF ALTERNATING COPOLYMERS OF BUTADIENE AND ACRYLONITRILE USING MANGANESE CHELATE, ZINC HALIDE AND MODIFIER

Akira Onishi, Koichi Irako, and Yoshihiro Hayakawa, Tokyo, Takeshi Shimomura, Kobe, and Koichi Iwami and Shoji Miyamoto, Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Oct. 28, 1969, Ser. No. 871,926
Claims priority, application Japan, Nov. 4, 1968, 43/79,877
Int. Cl. C08f *1/48*
U.S. Cl. 260—82.5 6 Claims

Alternating copolymers of a conjugated diene and a conjugated polar vinyl monomer, wherein the conjugated diene unit and the conjugated polar vinyl monomer unit are bonded substantially alternately, are produced by copolymerizing said conjugated diene with said conjugated polar vinyl monomer in the presence of a catalyst prepared from a component (A) of at least one metal chelate complex compound selected from the group consisting of metal chelate complex compounds having the general formula

$$MeL_n$$

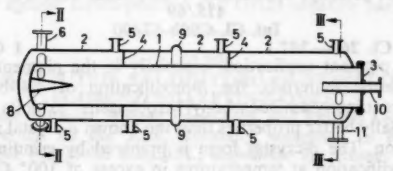
wherein Me represents manganese, cobalt or copper metal, *n* represents the valence of Me and L represents a ligand of 1,3-dicarbonyl compound and a component (B) of at least one zinc halide selected from the group consisting of zinc chloride and zinc bromide. Furthermore, the molecular weight of the alternate copolymer can be controlled and the gelation of the polymerization product can be inhibited by adding a modifier selected from the group consisting of thiol compounds and iodoform to the above polymerization reaction system.

3,660,366

POLYMERIZATION PROCESS

Tatsuo Horie, Tokyo, Tatsuo Fuchigami, Kawasaki-shi, and Mitsuo Okazawa, Yokohama-shi, Japan, assignors to Nippon Petrochemicals Co., Ltd., Tokyo, Japan

Filed Sept. 4, 1968, Ser. No. 757,390
Claims priority, application Japan, Sept. 8, 1967, 42/57,282, 42/57,441
Int. Cl. C08f *15/04*; C08d *3/02*
U.S. Cl. 260—85.3 16 Claims



A polymerization process in which the polymerization product is insoluble in the reaction mixture and the specific gravity of said product is smaller than that of the reaction mixture. In said polymerization reaction, the raw materials are fed into the reaction apparatus, so as to cause rotating current along the length of the apparatus, thus the lighter polymer is concentrated on the central position of the apparatus during the polymerization reaction and it is separated from the reaction mixture continuously. This apparatus can also be used for the reacted mixture after the reaction In order to separate the polymer in the mixture.

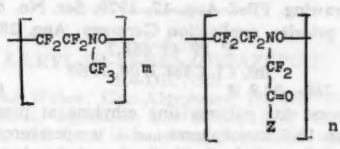
3,660,367

NITROSO POLYMERS

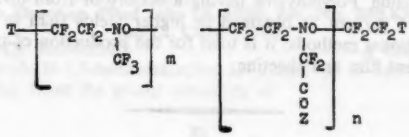
Nathan Mayes, Barrington, R.I., and Ronald Michaels, Boonton, N.J., assignors to Thiokol Chemical Corporation, Bistol, Pa.

No Drawing. Filed Nov. 13, 1968, Ser. No. 775,528
Int. Cl. C08f *3/24*
U.S. Cl. 260—92.1 9 Claims

A linear nitroso polymer has been provided by polymerizing monomers with pendant, convertible moieties which are crosslinkable. These monomers with the crosslinkable, pendant groups cannot be introduced into the polymer directly; hence, the contribution resides in the route of incorporating precursor moieties in the polymer backbone and then obtaining a polymer. The polymers with the convertible, pendant groups are derived from recurring units as represented by the general formulae:



or



wherein Z is a —O-(lower alkyl) group of 1 to 7 carbon atoms or chlorine; and T is a halogen, a perhaloalkyl, —NO, or —NO_2; and the ratio *m*:*n* is from 0:1 to 50:1. Liquid and solid polymers are provided as well as elastomers derived therefrom. A method for preparing and converting these monomers has also been disclosed.

3,660,368

HIGH POLYCHLOROPRENES

Chester Arthur Hargreaves II, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed June 27, 1967, Ser. No. 649,090
Int. Cl. C08f *1/10, 3/20*; C08d *3/14*
U.S. Cl. 260—92.3 5 Claims

Polychloroprenes which melt at temperatures of 80° C. and above. At least 95% of the chloroprene units of the polymer chain are trans-2-chloro-2-buten-1,4-ylene units and at least 95% of all 2-chloro-2-buten-1,4-ylene units in the polymer are in the head-to-tail sequence. The polychloroprenes are prepared by irradiating crystalline chloroprene at temperatures below —130° C.

3,660,369

METHOD OF PREPARING LINEAR POLYMERS OF CYCLOOLEFINS

Vitaly Abramovich Kormer, Ulitsa Zheleznovodskaya 62, kv. 2; Boris Davidovich Babitsky, Ulitsa Krasnogo Kursanta 7, kv. 9; Tatyana Lvovna Jufa, Ulitsa Mayakovskogo 3, kv. 23; and Irina Alexandrovna Poletaeva, Ulitsa III Internatsionala 74, kv. 212, all of Leningrad, U.S.S.R.

No Drawing. Filed Sept. 2, 1969, Ser. No. 854,733
Claims priority, application U.S.S.R., Sept. 6, 1968, 1,269,161; May 8, 1969, 1,326,641, 1,326,642
Int. Cl. C08f *7/00, 1/36*
U.S. Cl. 260—93.1 5 Claims

A method for the production of linear polymers of cyclomonoolefins which consists in the polymerization of

cyclomonoolefins in the temperature range of from —50° to +80° C. in the presence of a catalyst comprising π-complexes of metals of Groups IV–VIII of the Periodic System taken in combination with halides of elements of Groups III–VI of the Periodic System.

3,660,370

PRODUCTION OF POLYETHYLENE UNDER HIGH PRESSURE WITH METHYL ISOBUTYL KETONE PEROXIDE INITIATOR

Hans Gropper, Ludwigshafen, Kurt Stark, Heidelberg, and Helmut Pfannmueller and Friedrich Urban, Limburgerhof, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen, Germany

No Drawing. Filed Aug. 17, 1970, Ser. No. 64,649

Claims priority, application Germany, Aug. 28, 1969, P 19 43 698.7

Int. Cl. C08f *3/04, 1/60*

U.S. Cl. 260—94.9 R **6 Claims**

A process for polymerizing ethylene at pressures of more than 1000 atmospheres and at temperatures of from 150° to 400° C. in the presence of methyl isobutyl ketone peroxide. Polyethylene having a density of from 0.924 to 0.935 g./ccm. is obtained in higher yields than in conventional methods; it is used for the production of transparent film and sheeting.

3,660,371

UNSATURATED POLYESTER AND EPOXY-FUNCTIONAL GRADED-RUBBER PAINT AND PROCESS I

Olin B. Johnson, Livonia, and Santokh S. Labana, Dearborn Heights, Mich., assignors to Ford Motor Company, Dearborn, Mich.

No Drawing. Filed Dec. 21, 1970, Ser. No. 100,461

Int. Cl. C08g *45/14, 45/04, 15/00*

U.S. Cl. 117—93.31 **15 Claims**

A radiation-curable paint which on a pigment and particulate filler-free basis consists essentially of vinyl monomers and a unique, alpha-beta olefinically unsaturated, rubber-comprising resin formed by reacting an alpha-beta olefinically unsaturated, monocarboxy terminated, polyester having an alpha-beta olefinically unsaturated dicarboxylic acid or anhydride as a constituent monomer thereof with an epoxy-functional, graded-rubber particle. The dispersion is applied to substrates as a paint film and cured thereon by exposure to ionizing radiation, e.g., an electron beam.

3,660,372

BIPHENYL CONTAINING DIAZONIUM FLUORIDE COMPOUNDS

Erwin F. Schoenewaldt, Watchung, and George G. Hazen and Richard F. Shuman, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed July 31, 1968, Ser. No. 748,922

Int. Cl. C07c *113/00*

U.S. Cl. 260—141 **1 Claim**

The invention relates to various novel 5-(4-fluoro substituted phenyl) salicylic acid and derivatives thereof. These compounds are useful intermediates for preparing 5-(4-fluorophenyl) salicylic acids and derivatives thereof which latter compounds are useful anti-inflammatory agents. These compounds are prepared by decomposition of the intermediate diazonium fluorides.

3,660,373

PHENYL-AZO-HYDROXYNAPHTHOIC ACID AMIDE PIGMENTS

Armand Roueche, Neu-Allschwil, Switzerland, assignor to Ciba Limited, Basel, Switzerland

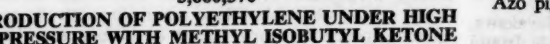
No Drawing. Filed Nov. 24, 1969, Ser. No. 879,615

Claims priority, application Switzerland, Dec. 12, 1968, 18,513/68

Int. Cl. C07b *29/20;* **C07c** *107/08*

U.S. Cl. 260—203 **6 Claims**

Azo pigments of the formula



in which R_1 represents an aromatic radical, R_2 represents a naphthalene radical in which the azo, hydroxy and —CO— groups are in 1,2,3-position, R_3 represents an arylene radical, X represents a direct bond or a —CO— group, and R_4 represents a carbamide group, an acylamino group or an acyl or carbalkoxyalkyl radical when X represents a direct bond, and R_4 represents an alkyl or aryl radical when X represents a —CO— group. They are useful for coloring plastics and lacquers in orange to red shades.

3,660,374

AZO COMPOUNDS FROM ALKYL α-ANILINOTOLUATES

Max A. Weaver, Herman S. Pridgen, and Clarence A. Coates, Jr., Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Nov. 5, 1968, Ser. No. 773,656

Int. Cl. C09b *29/08, 29/24;* **D06p** *3/52*

U.S. Cl. 260—207 **8 Claims**

Azo compounds containing a phenyl, thiazolyl, benzothiazolyl, thiadiazolyl or thienyl diazo component and an N - alkoxycarbonylbenzyl - N - aralkylaniline coupling component are useful as dyes for hydrophobic textile materials such as polyester fibers on which the compounds exhibit improved build-up, excellent brightness and superior fastness properties such as fastness to light and resistance to sublimation.

3,660,375

β - CRYSTAL MODIFICATION OF 4,4' - BIS-(α - ANTHRAQUINONYLAMINOCARBONYL)-AZOBENZENE PIGMENT

Klaus Ehrhardt, Basel, Georg Geiger, Reinach, Basel-Land, and Fritz Kehrer, Basel, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Jan. 8, 1970, Ser. No. 1,338

Claims priority, application Switzerland, Jan. 14, 1969, 415/69

Int. Cl. C09b *67/00*

U.S. Cl. 260—207.1 **1 Claim**

In pigment application, especially in the pigmentation of plastic materials, the β-modification of 4,4'-bis-(α-anthraquinonylaminocarbonyl)azobenzene exhibits substantially better properties than the known α-crystal modification. The β-crystal form is prepared by grinding the α-modification at temperatures in excess of 100° C.

3,660,376

N-ARYLIDENE ERYTHROMYCYLAMINES

Eddie H. Massey, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Continuation-in-part of application Ser. No. 878,935, Nov. 21, 1969. This application Sept. 30, 1970, Ser. No. 77,049

Int. Cl. C07c *47/18*

U.S. Cl. 260—210 E **4 Claims**

N-arylidene derivatives of erythromycylamine and of erythromycyl B amine having improved oral activity with concomitant decrease in side effects.

3,660,377
PRODUCTION OF RESINS FROM REDUCING SUGARS

Raoul Guillaume Philippe Walon, Brussels, Belgium, assignor to CPC International Inc.

No Drawing. Filed Oct. 10, 1969, Ser. No. 865,508
Int. Cl. C07c 95/04
U.S. Cl. 260—211 R 8 Claims

Covers a novel edible reducing sugar based resin having ion exchange capability. Also covers methods for producing said resin.

3,660,378
2-BENZYLTHIOINOSINE-5'-PHOSPHATE AND DERIVATIVES THEREOF

Kiyofumi Ishii, Ikeda, Jun Toda and Hisashi Aoki, Suita, and Yutaka Kuwada, Ashiya, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

No Drawing. Filed Feb. 20, 1969, Ser. No. 801,145
Claims priority, application Japan, Feb. 20, 1968, 43/10,711; Nov. 19, 1968, 43/84,775
Int. Cl. C07d 51/54
U.S. Cl. 260—211.5 R 4 Claims

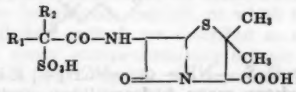
The 2-benzylthioinosine-5'-phosphate has the ability for improving or enhancing the flavor of foods and beverages. Moreover, there is a significant synergistic action between the compound and monosodium glutamate. The compound is produced by phosphorylating 2-benzylthioinosine or 2-benzylthio-2',3'-isopropylideneinosine.

3,660,379
SYNTHETIC PENICILLINS

Shiro Morimoto, Kobe, Hiroaki Nomura, Osaka, Takeshi Fugono and Kihachiro Maeda, Hyogo, and Toshihiro Ishiguro, Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

No Drawing. Filed Sept. 29, 1969, Ser. No. 862,018
Claims priority, application Japan, Sept. 28, 1968, 43/70,572
Int. Cl. C07d 99/16
U.S. Cl. 260—239.1 25 Claims

Synthetic penicillins of the general formula



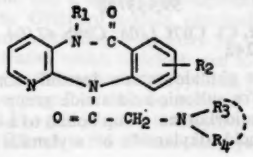
wherein R_1 and R_2 are hydrogen, alkyl, cycloalkyl, aralkyl or unsubstituted or substituted phenyl, pyridyl, naphthyl or thienyl or alternatively, R_1 and R_2 together form a polymethylene group, and pharmaceutical salts thereof, as well as a process for the preparation thereof. These compounds are useful as antibacterial agents, and especially against Gram-positive and Gram-negative bacteria.

3,660,380
11-SUBSTITUTED 5,11-DIHYDRO-6H-PYRIDO[2,3-b][1,4]BENZODIAZEPIN-6-ONES

Gunther Schmidt, Robert Engelhorn, and Matyas Leitold, Biberach an der Riss, Germany, assignors to Boehringer Ingelheim G.m.b.H., Ingelheim am Rhine, Germany

No Drawing. Filed Aug. 7, 1969, Ser. No. 848,345
Claims priority, application Germany, Aug. 20, 1968, P 17 95 183.6
Int. Cl. C07d 53/02
U.S. Cl. 260—239.3 10 Claims

11-aminoacetyl - 5,11 - dihydro-6H-pyrido[2,3-b][1,4] benzodiazepin-6-ones of the formula



wherein

R_1 is hydrogen or alkyl of 1 to 4 carbon atoms,

R_2 is hydrogen, halogen or methyl, and

R_3 and R_4 are each straight or branched alkyl of 1 to 5 carbon atoms or, together with each other and the nitrogen atom to which they are attached, camphidino or a 5- to 7-membered saturated monocyclic heterocyclic ring which may optionally comprise an oxygen or another nitrogen ring atom and/or may optionally have an alkyl of 1 to 4 carbon atoms, hydroxy-alkyl of 1 to 4 carbon atoms, benzyl or methyl-benzyl substituent attached to a ring atom,

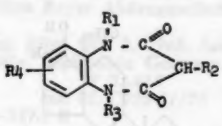
and non-toxic, pharmacologically acceptable acid addition salts thereof, useful as inhibitors of stomach ulcers and stomach juice secretion, as well as antitussives and antiemetics.

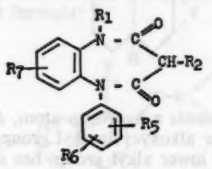
3,660,381
5-ARYL-1H-1,5-BENZODIAZEPINE-2,4-DIONES

Karl-Heinz Weber, Gau-Algesheim, Herbert Merz and Karl Zeile, Ingelheim am Rhein, Rolf Giesemann, Bingen, and Peter Danneberg, Ingelheim am Rhein, Germany, assignors to C. H. Boehringer Sohn, Ingelheim am Rhein, Germany

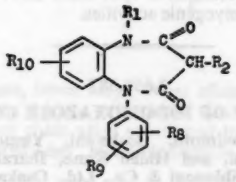
No Drawing. Filed July 10, 1969, Ser. No. 840,839
Int. Cl. C07d 53/04
U.S. Cl. 260—239.3 8 Claims

5-aryl-1H-1,5-benzodiazepine-2,4-diones of a formula selected from the group consisting of





and



wherein

R_1 is allyl, methylallyl, dimethylallyl, chloroallyl, cyclohexyl, cycloalkylmethyl, cycloalkylenylmethyl of 4 to 7 carbon atoms, phenyl, tolyl, xylyl, methoxyphenyl, dimethoxyphenyl, halophenyl, phenylalkyl of 7 to 8 carbon atoms, pyridyl or

—A—X

where

A is straight or branched alkylene of 1 to 4 carbon atoms, and

X is hydroxyl, alkoxy, acyloxy, dialkylamino of 2 to 4 carbon atoms, or a 5- to 6-membered nitrogen-containing heterocyclic ring linked to A through a ring nitrogen atom,

R_2 is hydrogen or methyl,

R_3 is naphthyl, pyrimidyl, thienyl, pyridyl, methylpyridyl or halopyridyl,

R_4 is hydrogen, methyl, methoxy, trifluoromethyl, cyano, halogen, lower alkanoyl or (lower alkoxy of 1 to 2 carbon atoms)-carbonyl,
R_5 is hydrogen, methyl, ethyl, methoxy, trifluoromethyl, cyano, nitro, halogen, lower alkanoyl or lower alkoxycarbonyl,
R_6 is hydrogen, methyl, ethyl, methoxy or halogen,
R_7 is cyano, lower alkanoyl or lower alkoxycarbonyl,
R_8 is cyano, nitro, lower alkanoyl or lower alkoxycarbonyl,
R_9 is hydrogen, methyl, ethyl, methoxy or halogen, and
R_{10} is hydrogen, methyl, methoxy, trifluoromethyl or halogen,
useful as psychosedative and anticonvulsives in warm-blooded animals.

3,660,382

18-METHYL-2α-3α-EPITHIO-5α-ANDROSTANE DERIVATIVES

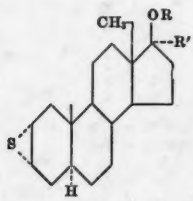
Taichiro Komeno, Osaka-shi, Japan, assignor to Shionogi & Co., Ltd., Osaka, Japan

No Drawing. Filed Mar. 17, 1969, Ser. No. 807,916

Claims priority, application Japan, Mar. 18, 1968, 43/17,702

Int. Cl. C07c *173/00*
U.S. Cl. 260—239.5 2 Claims

A compound of the formula



wherein R represents a hydrogen atom, a lower alkanoyl group or 1-lower alkoxycycloalkyl group and R′ is a hydrogen atom or lower alkyl group, has strong anti-estrogenic activity accompanied with lesser side effects such as androgenic and myogenic activities.

3,660,383

PRODUCTION OF IODOISOXAZOLE COMPOUNDS

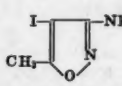
Shinzaburo Sumimoto, Osaka-shi, Yasuo Makisumi, Amagasaki-shi, and Hideo Kano, Ibaraki-shi, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

No Drawing. Filed Aug. 6, 1969, Ser. No. 848,106

Claims priority, application Japan, Aug. 14, 1968, 43/57,834

Int. Cl. C07d *85/22, 85/24*
U.S. Cl. 260—239.9 5 Claims

3-(substituted or unsubstituted)amino-4-iodo-5-methylisoxazole derivatives of the formula:



wherein R represents hydrogen, p-(lower)alkanoylaminobenzenesulfonyl group, p-nitrobenzenesulfonyl group, (lower)alkanoyl group or (lower)alkoxycarbonyl group are prepared in very high yield with high purity by reacting 3-(substituted or unsubstituted)amino-5-methylisoxazole derivatives with a reagent mixture from iodine and chlorine in acetic acid or methanol, in the presence of a base.

3,660,384

5-[2-(5-NITRO-2-FURYL)VINYL]PICOLINOHYDROXAMIC ACID

Roland N. Johnson, Norwich, N.Y., assignor to The Norwich Pharmacal Company

No Drawing. Filed Mar. 16, 1970, Ser. No. 20,067

Int. Cl. C07d *99/04*
U.S. Cl. 260—240 A 1 Claim

A new compound, 5-[2-(5-nitro-2-furyl)vinyl]picolinohydroxamic acid, is an antibacterial useful in combating *Shigella flexneri* and *Escherichia coli* infection in animals upon peroral administration.

3,660,385

2-(5-NITRO-2-FURFURYLIDENE)-1-TETRALONES

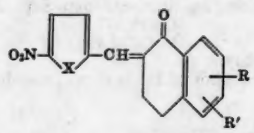
Rudolf Albrecht, Hans-Joachim Kessler, and Eberhard Schroder, Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

No Drawing. Filed July 16, 1970, Ser. No. 55,593

Claims priority, application Germany, July 19, 1970, P 19 37 630.8

Int. Cl. C07d *5/16, 27/22, 63/12*
U.S. Cl. 260—240 A 25 Claims

2-(5-nitro-2-furfurylidene)-1-tetralones of the formula



wherein X is O, S, —NH— or —NCH_3—; R is a free or esterified hydroxy group, hydroxyalkoxy, acyloxyalkoxy, alkoxyalkoxy, dialkylaminoalkoxy, pyrrolidinoalkoxy, piperidinoalkoxy, morpholinoalkoxy, piperazinoalkoxy, acylamino, amino, alkylsulfonylamino, monoalkylamino, dialkylamino, carboxy, carbalkoxy or nitro; and R′ is a hydrogen atom, a halogen atom, an alkyl group, or a free, etherified or esterified hydroxy group, have anti-trichomonadal activity.

3,660,386

PYRIMIDINE DYESTUFFS

Jakob Benz, Oberwil, Basel-Land, and August Schweizer, Muttenz, Basel-Land, Switzerland, assignors to Sandoz Ltd. (also known as Sandoz AG), Basel, Switzerland

No Drawing. Continuation-in-part of application Ser. No. 629,120, Apr. 7, 1967, which is a division of application Ser. No. 588,630, Oct. 21, 1966, which in turn is a continuation of application Ser. No. 813,681, May 18, 1959. This application Oct. 9, 1969, Ser. No. 865,214

Claims priority, application Switzerland, May 28, 1958, 59,953/58

Int. Cl. C07f *1/08;* C09b *47/04*
U.S. Cl. 260—242 7 Claims

Water-soluble phthalocyanine dyestuffs containing sulfonic acid and/or sulfonic acid amide group and at least one trihalopyrimidylamino group bound to a carbon atom of a sulfonic acid alkylamide or arylamide group.

3,660,387

1H-3,4-DIHYDRO-2,3-BENZOXAZINE DERIVATIVES

Giorgio Piffert and Pierfranco Schiatti, Milan, Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

No Drawing. Filed Dec. 24, 1968, Ser. No. 786,775
Claims priority, application Great Britain, Feb. 2, 1968, 5,502/68
Int. Cl. C07d 87/12
U.S. Cl. 260—244 R 10 Claims

The invention relates to benzoxazines having in the 3-position hydrogen, lower alkyl, dialkylaminoalkyl, aralkyl carbamoyloxyalkyl, alkyl substituted by a heterocyclic ring, hydroxyalkyl, acyloxyalkyl, acyl, amidino, carbamoyl, arylcarbamoyl or nitroso, the 6- or 7-position being substituted by halogen, nitro or amino. Various procedures are described for preparing the 3-unsubstituted-6(7)-substituted benzoxazines as well as the 3-substituted compounds, both by single step and multi-step introduction of substituents into the 3- and 6(7)-positions, and by ring closure reactions of ortho-disubstituted halogeno or nitro benzene. The compounds have anti-inflammatory activity and are active also on the central nervous system.

3,660,388

BIS-DIOXO-MORPHOLINE DERIVATIVES BIS[2,6 DIOXOMORPHOLINYL-(4)]PHENYLENES AND ALKYLENES

Joachim Dazzi, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 688,667, Dec. 7, 1967. This application Apr. 3, 1970, Ser. No. 25,591
Claims priority, application Switzerland, Dec. 14, 1966, 17,930/66
Int. Cl. C07d 87/42
U.S. Cl. 260—246 B 8 Claims

Certain bis-dioxo-morpholino derivatives in which the nitrogen atoms of the two morpholino nuclei are linked with each other via a bridge member which is an alkylene radical optionally interrupted by hetero atoms or by carbocyclic or heterocyclic radicals, or which is an arylene or cycloalkylene radical, are described as useful in the curing of epoxy groups-containing organic compounds. Their production comprises the reaction of a diimino-tetracarboxylic acid in which the two imino nitrogen atoms are linked by the same bridge member as defined above, with an anhydride of an organic monocarboxylic acid or a ketene.

3,660,389

10,11 - DIACYLOXY - 10,11-DIHYDRO-5-TERTIARY AMINO PROPYL - 5-HYDROXY-5H-DIBENZO[a,d] CYCLOHEPTENES

Howard B. Hucker, Horsham, and Marcia E. Christy, Perkasie, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Application Jan. 29, 1968, Ser. No. 723,964, now Patent No. 3,576,823, dated Apr. 27, 1971, which is a division of application Ser. No. 296,463, July 22, 1963, now Patent No. 3,390,179, dated June 25, 1968. Divided and this application June 22, 1970, Ser. No. 48,478
Int. Cl. C07d 87/46, 87/36
U.S. Cl. 260—247.2 15 Claims

A cis or trans 3α,12β-dihydro-8H-dibenzo[3,4:6,7]cyclohepta[1,2-d]-1,3-dioxol-8-one is treated with a Grignard reagent, i.e., a tertiary aminoproplymagnesium halide, and the Grignard adduct obtained hydrolyzed to form the corresponding 5-hydroxy-5-(3-tertiary aminopropyl) derivative which is dehydrated to form the corresponding 5-(3-tertiary aminopropylidene) derivative. The resulting compound is then hydrolyzed to form the cis or trans 10,11 - dihydro-10,11-dihydroxy-5-(3-dimethylaminopropylidene) - 5H-dibenzo[a,d]cycloheptene. Such compounds may be demethylated to produce the corresponding N-methylaminopropylidene compound. The compounds are useful as antidepressants.

3,660,390

SUBSTITUTED 5-NITRO-2-FURYLAMIDOXIMES

Anne Mary Von Esch, North Chicago, and Aldo Joseph Crovetti, Lake Forest, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

No Drawing. Continuation-in-part of application Ser. No. 640,343, May 22, 1967, which is a continuation-in-part of application Ser. No. 532,571, Mar. 8, 1966, which in turn is a division of application Ser. No. 314,849, Oct. 9, 1963, now Patent No. 3,272,828. This application Aug. 12, 1968, Ser. No. 751,706
Int. Cl. C07d 99/00, 5/16
U.S. Cl. 260—247.2 4 Claims

Compounds comprising disubstituted acyl amide oximes with one of the substituents being 5-nitro-2-furyl. These compounds are useful as antibacterial and antifungal agents.

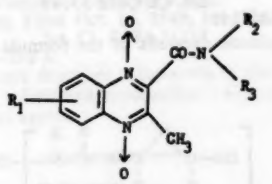
3,660,391

2-METHYL - 3 - CARBOXYLIC ACID AMIDO-QUINOXALINE-1,4-DI-N-OZIDES AND THEIR PRODUCTION

Kurt Ley, Odenthal-Globusch, Ulrich Eholzer, Cologne-Stammheim, Roland Nast, Cologne-Buchheim, Karl Georg Metzger, Wuppertal-Elberfeld, and Dieter Fritsche, Wuppertal-Vohwinkel, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Oct. 2, 1968, Ser. No. 764,611
Claims priority, application Germany, Oct. 4, 1967, F 53,665
Int. Cl. C07d 51/78
U.S. Cl. 260—247.5 R 20 Claims

2-methyl-3-carboxylic acid-amido-quinoxaline - 1,4-di-N-oxides of the formula:



(I)

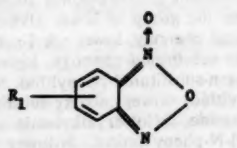
wherein:

R_1 is hydrogen, lower alkyl, lower alkoxy or chlorine,

R_2 is hydrogen, straight or branched chain alkyl or straight or branched chain alkyl substituted by hydroxy, lower alkoxy, carbalkoxy, monoalkylamino or dialkylamino, and

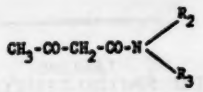
R_3 is hydrogen, straight or branched chain alkyl, straight or branched chain alkyl substituted by hydroxy, lower alkoxy, carbalkoxy, monoalkylamino or dialkylamino, or when R_2 is hydrogen, cyclohexyl, or R_2 and R_3 together with the amide nitrogen atom form part of a 5- or 6-membered heterocyclic ring,

are useful for their antibacterial effect. These compounds may be produced, inter alia, by reacting a benzofuroxan of the formula:



(II)

with an acetoacetic acid amide of the formula:



(III)

wherein R_1, R_2 and R_3 are as above defined.

3,660,392

METHOD FOR PURIFYING TRIS(β-HYDROXYALKYL)ISOCYANURATES

Alexander Sadle, Morristown, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Nov. 12, 1970, Ser. No. 89,067
Int. Cl. C07d 55/38
U.S. Cl. 260—248 NS 2 Claims

An improved method for purifying tris(β-hydroxyalkyl)isocyanurates by recrystallizing from an azeotropic mixture of methanol and methyl ethyl ketone.

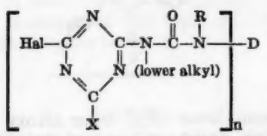
3,660,393

ANTHRAQUINONYL-TRIAZINES

Hans Ackermann, Bottmingen, and Herbert Seiler and Hubert Meindl, Riehen, Switzerland, assignors to Ciba-Geigy AG

No Drawing. Division of application Ser. No. 800,300, Nov. 8, 1968, which is a continuation of application Ser. No. 517,998, Jan. 3, 1966, which in turn is a continuation-in-part of application Ser. No. 380,677, July 6, 1964. This application May 7, 1970, Ser. No. 35,581
Int. Cl. C07d 55/46
U.S. Cl. 260—249 3 Claims

Anthraquinone dyestuffs of the formula



wherein

D is an anthraquinone dyestuff radical;

is connected to an aromatic ring carbon of D;
R is H or lower alkyl;
Hal is F, Cl or Br;
n is one of the integers 1 or 2 and
X is a monovalent electron-donor substituent, selected from the group of lower alkoxy, phenoxy, halogen-substituted phenoxy, lower alkyl-substituted phenoxy, lower alkoxy-substituted phenoxy, lower alkylthio, phenylthio, halogen-substituted phenylthio, lower alkyl-substituted phenylthio, lower alkoxy-substituted phenylthio, lower alkylamino, di(lower)alkylamino, phenylamino, N-lower alkyl-N-phenylamino, N-lower alkyl-N-halogenphenylamino, N-lower alkyl-N-lower alkylphenylamino, N-lower alkyl-N-lower alkoxyphenylamino, piperidino or morpholino, halogen being chloro or bromo.

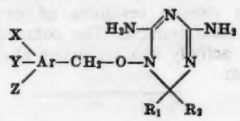
3,660,394

4,6-DIAMINO-1,2-DIHYDRO-ARYLOXY-1,3,5-TRIAZINES

Patrick Mamalis, Reigate, England, assignor to Vitamins Limited, London, England

No Drawing. Original application Dec. 5, 1968, Ser. No. 781,625. Divided and this application Jan. 23, 1970, Ser. No. 8,763
Int. Cl. C07d 55/20
U.S. Cl. 260—249.9 8 Claims

Compounds of the formula:



(I)

wherein:
Ar is a mono or poly nuclear aromatic ring system;
X is hydrogen or halogen;
Y is hydrogen or halogen;
Z is hydrogen or halogen;
R_1 is lower alkyl of 1 to 4 carbon atoms;
R_2 is hydrogen or lower alkyl of 1 to 4 carbon atoms or R_1 and R_2 may be linked to one another to form a spiro-cyclo-alkane moiety which includes the 2 carbon atoms of the triazine ring, or R_1 and R_2 may be linked together to form a lower alkane spiro-cyclo-alkane moiety including the 2 carbon atoms of the triazine ring, said spiro-cyclo-alkane moiety having 5 to 7 carbon atoms and said lower alkyl moiety having 1 to 4 carbon atoms,

or pharmaceutically acceptable non-toxic salts thereof have been found to be useful for their anti-malarial activity. They are administered in a general dosage range of 0.7 to 70 mg./kg. per day.

3,660,395

THIOETHER CEPHALOSPORIN COMPOUNDS

Ian G. Wright, Greenwood, and Gary V. Kaiser, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Filed Mar. 4, 1970, Ser. No. 16,561
Int. Cl. C07d 99/24, 99/16
U.S. Cl. 260—243 C 19 Claims

2-thiomethyl- and 2-thiomethylene ethers of Δ^3-cephem - 4 - carboxylic acids, e.g., 3-acetoxymethyl-2-phenylthiomethylene-7-(2'-thienylacetamido) Δ^3-cephem-4-carboxylic acid, useful as antibiotics, esters of such acids which are useful as intermediates to make antibiotic compounds.

3,660,396

CEPHALOSPORIN INTERMEDIATES AND PROCESS THEREFOR

Ian G. Wright, Greenwood, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Filed Mar. 4, 1970, Ser. No. 16,573
Int. Cl. C07d 99/24, 99/16
U.S. Cl. 260—243 C 12 Claims

2 - methylene- and 2-methyl - Δ^3 - cephalosporin esters, and sulfoxides therof; e.g., 2,2,2-trichloroethyl 7-phenoxy-

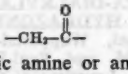
acetamido - 2 - methylene - 3 - methyl-Δ^3-cephem-4-carboxylate - 1 - oxide, as intermediates to new cephalosporin antibiotic substances.

3,660,397
IMIDAZO[4,5-b]PYRAZINES
James H. Jones, Blue Bell, and Edward J. Cragoe, Jr., Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.
No Drawing. Filed Apr. 17, 1970, Ser. No. 29,674
Int. Cl. C07d *51/76*
U.S. Cl. 260—250 R 20 Claims

Imidazo[4,5-b]pyrazines bearing a hydrogen or hydrocarbyl substituent in the two position are prepared by cyclization of a 2-amino-3-acylamino pyrazine.

3,660,398
PREPARATION OF QUINOXALINE-DI-N-OXIDES
Kurt Ley, Leverkusen, and Ulrich Eholzer, Roland Nast, and Florin Seng, Cologne, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Continuation of application Ser. No. 631,893, Apr. 19, 1967. This application Apr. 7, 1970, Ser. No. 24,422
Int. Cl. C07d *51/78*
U.S. Cl. 260—250 R 9 Claims

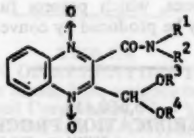
Quinoxaline-di-N-oxides, having pharmacological properties and usable as intermediates for producing plant protection agents, produced by reacting in an organic diluent (e.g. at 20–100° C.) benzofurazane-N-oxide (optionally substituted with halo, alkyl, alkoxy, acyl, substituted acyl, amido, substituted amido, sulfonamido, and/or substituted sulfonamido) with a reagent composed of either (a) at least an equivalent quantity of both an organic carbonyl compound (e.g. linear or cyclo aliphatic, aryl, or heterocyclic carbonyl compound) with is optionally substituted and which contains the linkage



and a primary aliphatic amine or ammonia; or (b) at least an equivalent quantity of the corresponding Schiff's base to the reagent under (a).

3,660,399
QUINOXALINE-DI-N-OXIDE-HYDROXY-LACTONE AND ITS PRODUCTION
Florin Seng, Cologne, and Kurt Ley, Odenthal-Glorbusch, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed June 16, 1970, Ser. No. 46,815
Claims priority, application Germany, July 10, 1969, P 19 34 888.0
Int. Cl. C07d *51/78*
U.S. Cl. 260—250 R 9 Claims

Quinoxaline-di-N-oxide-hydroxy-lactone is produced by reacting quinoxaline-di-N-oxide of the formula:



wherein

R^1 and R^2 are the same or different and are lower alkyl, or R^1 and R^2 are each lower alkyl linnked together with the adjacent nitrogen atom to form a 5- or 6-membered heterocyclic ring,

R^3 and R^4 are the same or different lower alkyl moieties, or R^3 and R^4 are the same or different lower alkyl moieties linked together with the nitrogen atom to form a 5- or 6-membered heterocyclic ring,

in a diluent with at least the theoretically necessary amount of an inorganic or organic acid at a temperature of from about 0° C. to about 50° C. in the presence of at least the stoichiometrically necessary amount of water.

3,660,400
LOWER ALKYL 3-HYDROXY AND 3-MERCAPTOPYRAZINOATES
Edward J. Cragoe, Jr., Lansdale, and James H. Jones, Blue Bell, Pa., assignors to Merck & Co., Inc., Rahway, N.J.
No Drawing. Original application Nov. 17, 1966, Ser. No. 594,996, now Patent No. 3,472,848, dated Oct. 14, 1969. Divided and this application July 29, 1969, Ser. No. 845,890
Int. Cl. C07d *51/76*
U.S. Cl. 260—250 R 5 Claims

Lower alkyl 3-hydroxy- and 3-mercapto-pyrazinoates and corresponding ethers and thioethers are prepared by diazotization of lower alkyl 3-aminopyrazinoates followed by treatment with water to give the 3-hydroxy compounds, or an alcohol to give the 3-ether compounds and with bromine and hydrogen bromide to give the 3-bromo compounds. The latter compounds are then converted into the 3-mercapto compounds by treatment with sodium sulfide and sulfur or into the 3-thio-ethers by treatment with an alkali metal mercaptide. The compounds are useful as intermediates for the preparation of the corresponding pyrazinoylguanidines which have utility as diuretic and saluretic compounds.

3,660,401
2-(HETEROCYCLIC SUBSTITUTED)QUINOXALINE-1,4-DIOXIDES
Gerald Berkelhammer, Princeton, and Peter Herman Gund, East Windsor, N.J., assignors to American Cyanamid Company, Stamford, Conn.
No Drawing. Filed Oct. 16, 1969, Ser. No. 867,070
Int. Cl. C07d *51/78*
U.S. Cl. 260—250 R 10 Claims

This disclosure describes compounds of the class of 2-(heterocyclic substituted)quinoxaline-1,4-dioxides useful as antibacterial agents.

3,660,402
BENZAZOCINO QUINAZOLINES
Dietmar A. Habeck, Dover, and William J. Houlihan, Mountain Lakes, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.
No Drawing. Filed Sept. 10, 1970, Ser. No. 71,280
Int. Cl. C07d *51/48*
U.S. Cl. 260—251 A 2 Claims

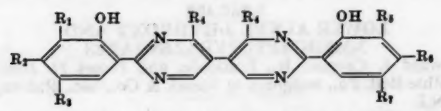
Benzazocino quinazolines, e.g. 5,6,7,8-tetrahydro-14H-[1]benzazocino[2,1-b]quinazolin-14-one, prepared from anthranilic acids or esters thereof and novel substituted benzazo compounds, are useful as sedative-hypnotics.

3,660,403
HALOPHENYLPYRIMIDINE CARBOXYLIC ACIDS
Tsung-Ying Shen, Gordon L. Walford, and Bruce E. Witzel, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.
No Drawing. Filed June 25, 1969, Ser. No. 836,647
Int. Cl. C07d *51/38*
U.S. Cl. 260—251 R 4 Claims

2-halophenyl-4-(or 5)-hydroxy-5(or 4)-pyrimidinecarboxylic acids and certain derivatives having anti-inflammatory activity are described.

3,660,404
U.V.-ABSORBING ORTHO-HYDROXYPHENYL SUBSTITUTED BIPYRIMIDYLS
Jan-Eric A. Otterstedt, Simrishamn, Sweden, and Richard Pater, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Feb. 24, 1969, Ser. No. 801,842
Int. Cl. C07d *51/36*
U.S. Cl. 260—256.4 R **7 Claims**

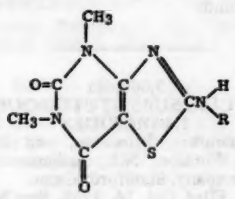
Ultraviolet absorbing bipyrimidyls of the formula



where R_{1-3} and R_{5-7} are selected from hydrogen, chlorine, hydroxy, alkyl, alkoxy and acyloxy, and R_4 is hydrogen; useful to protect photodegradation-prone substrates; and process for preparing same by condensing selected amidines with a tetraformylethane in a solvent containing an acid-binding agent.

3,660,405
THIAZOLOPYRIMIDINES
Arthur Berger, Skokie, Ill., and Edeltraut E. Borgaes, Sindelfingen, Germany, assignors to Baxter Laboratories, Inc., Morton Grove, Ill.
No Drawing. Filed Aug. 13, 1969, Ser. No. 849,899
Int. Cl. C07d *51/46*
U.S. Cl. 260—256.5 R **6 Claims**

Thiazolopyrimidines having the general formula:



wherein R is selected from the group consisting of lower alkyl having from 1 to 4 carbon atoms and allyl, for example, 4,6-dimethyl - 2 - n-propylaminothiazolo-[4,5-d]-pyrimidine-5,7,dione. These compounds are useful central nervous system anti-depressants.

3,660,406
2-CHLORO-7-HYDROXY-11-(1-PIPERAZINYL)DIBENZ[b,f][1,4]OXAZEPINES
Charles Frederick Howell, Upper Saddle River, N.J., and Eugene Newton Greenblatt, Rockland, N.Y., assignors to American Cyanamid Company, Stamford, Conn.
No Drawing. Filed Oct. 26, 1970, Ser. No. 84,221
Int. Cl. C07d *51/70*
U.S. Cl. 260—268 TR **4 Claims**

Preparation of 2-chloro-7-hydroxy-11-(4-substituted-1-piperazinyl)dibenz[b,f][1,4]oxazepines by several methods is described. These compounds are useful for their effects on the central nervous system such as tranquilizers and antidepressants.

3,660,407
PURIFICATION OF FLAVANTHRONE YELLOW PIGMENT
James W. Kay, Riegelsville, and Robert E. Norwood, Easton, Pa., assignors to Pfizer Inc., New York, N.Y.
No Drawing. Filed June 2, 1969, Ser. No. 829,700
Int. Cl. C07d *39/00*
U.S. Cl. 260—273 **1 Claim**

A process of purifying impure flavanthrone yellow pigment which utilizes extractants such as N,N'-dimethylacetamide, N,N'-dimethylformamide or dimethylsulfoxide.

3,660,408
BIS CYCLIC IMIDES OF 3-SUBSTITUTED 2,4,6-TRIIODOANILINES
James H. Ackerman, Bethlehem, N.Y., assignor to Sterling Drug Inc., New York, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 715,583, Mar. 25, 1968. This application July 14, 1969, Ser. No. 841,604
Claims priority, application Canada, Mar. 18, 1969, 46,086
Int. Cl. C07d *31/32*
U.S. Cl. 260—281 **2 Claims**

Mono and bis cyclic imides and anilic acids of 2,4,6-triiodoanilines bearing a substituted amino group in the 3-position are prepared by decarboxylation of the corresponding compounds bearing a carboxyl group in the 5-position. The products are useful as intermediates and as cholecystographic agents.

3,660,409
METHOD FOR MAKING ENOL ETHERS
Siegfried H. Schroeter, Schenectady, N.Y., assignor to General Electric Company
No Drawing. Filed Oct. 27, 1969, Ser. No. 869,892
Int. Cl. C07c *41/00*
U.S. Cl. 260—611 A **7 Claims**

The pyrolysis of 3-alkoxyoxetanes, for example, 2,2-diphenyl-3-ethoxyoxetane, has been found to provide for the production of branched enol ethers, such as 1,1-diphenyl-2-ethoxyethylene. The branched enol ethers can be employed as fragrants and converted to branched aldehydes, ketones and polyalkoxyalkylenes.

3,660,410
N-ACYL-PARA-DIALKYLAMINOPHENYL-HYDRAZONES
Karl Heinz Büchel, Wuppertal-Elberfeld, Ferdinand Grewe, Burscheid, and Paul-Ernst Frohberger and Helmut Kaspers, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Nov. 13, 1969, Ser. No. 876,589
Claims priority, application Germany, Nov. 23, 1968, P 18 10 581.2
Int. Cl. C07c *103/42*
U.S. Cl. 260—293.76 **7 Claims**

N - acyl - para - dialkylaminophenyl - hydrazones, i.e. N - (4 - dialkylamino- and 4 - tetra to penta methyleneimino-substituted phenyl)-N-(alkanoyl, chloroalkanoyl, alkenoyl, carboalkoxy, benzoyl and carbophenoxy)-N'-[(acetyl and cyano)-(alkanoyl and carboalkoxy)-carbonyl]-hydrazones, or N-(4-dialkylamino-, 4-pyrrolidino- and 4-piperidino-substituted phenyl)-N-(alkylcarbonyl, chloroalkylcarbonyl, alkenylcarbonyl, alkoxycarbonyl, phenylcarbonyl and phenoxycarbonyl)-N'-[(methylcarbonyl and cyano)-(alkylcarbonyl and alkoxycarbonyl)-carbonyl]-hydrazones, which possess fungicidal properties and which may be produced by conventional methods.

3,660,411
ESTERIFICATION PROCESS
Joseph Levy, Paramus, and William Walker, Rutherford, N.J., assignors to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Filed June 15, 1970, Ser. No. 46,514
Int. Cl. C07d *29/24*
U.S. Cl. 260—293.81 **10 Claims**

Esterification of a benzoic acid with a tertiary amino alcohol by refluxing in an inert solvent and formic acid cata-

lyst. In a specific embodiment, p-nitrobenzoic acid is esterified with diethylaminoethanol to prepare diethylaminoethyl p-nitrobenzoate.

3,660,412
PREPARATION OF TRITHIOCARBONATE ESTERS
Rudiger D. Haugwitz, Highland Park, N.J., assignor to Olin Corporation
No Drawing. Filed Jan. 27, 1970, Ser. No. 6,300
Int. Cl. C07d *31/50*
U.S. Cl. 260—294.8 E 7 Claims

Carbon bisulfide is reacted with alkali metal hydroxide in dimethyl sulfoxide to form a solution of alkali metal trithiocarbonate and this solution is reacted with an organic halide reactive therewith to produce a trithiocarbonate ester. Trithiocarbonate esters are known to possess antifungal activity.

3,660,413
PHOSPHOROTHIOAMIDES
Lindley A. Cates, Houston, Tex., assignor to Research Corporation, New York, N.Y.
No Drawing. Filed Aug. 25, 1969, Ser. No. 852,945
Int. Cl. C07d *31/50*
U.S. Cl. 260—294.8 K 6 Claims

Antibacterial phosphorothioamides are prepared by the reaction of phosphorothiocyanates with hydrazine or hydrazides.

3,660,414
CERTAIN 5-ARYL-2-AMINO-NICOTINONITRILES
Goetz E. Hardtmann, Florham Park, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.
No Drawing. Filed June 1, 1970, Ser. No. 42,539
Int. Cl. C07d *31/46*
U.S. Cl. 260—294.9 1 Claim

The invention discloses processes for the preparation of 5-aryl-2-amino-nicotinonitriles.

3,660,415
3-CYANO-2-SUBSTITUTED-5-ARYL-PYRIDINE DERIVATIVES
Goetz E. Hardtmann, Florham Park, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.
No Drawing. Filed June 1, 1970, Ser. No. 42,540
Int. Cl. C07d *31/46*
U.S. Cl. 260—294.9 12 Claims

The invention discloses pyridines substituted at the 2-position and also having an aryl substituent at the 5-position and cyano at the 3-position, e.g. [3-cyano-5-(p-chlorophenyl)-2-pyridyloxy]acetic acid ethyl ester and 5-phenyl-2-dimethylamino-ethylamino-nicotinonitrile. Such pyridine derivatives are useful as pharmaceutical agents, e.g. as anti-inflammatory agents. The compounds may be prepared by reacting a 2-halo-5-aryl-nicotinonitrile with the appropriate derivative of the substituent desired at the 2-position according to established procedures.

3,660,416
PREPARATION OF ALDEHYDES FROM ESTERS
Jaroslav Vit, Belle Mead, N.J., assignor to National Patent Development Corporation, New York, N.Y.
No Drawing. Filed Jan. 28, 1970, Ser. No. 6,565
Int. Cl. C07d *31/32*
U.S. Cl. 260—297 R 11 Claims

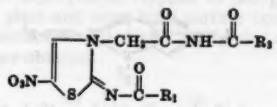
Organic esters are reduced to aldehydes by using sodium aluminum hydrides of the formula

$$NaAlH_x(OR_1)_{4-x}$$

at a low temperature, preferably in an ether or aromatic hydrocarbon, R_1 is ether lower alkoxy lower alkyl, lower dialkylamino lower alkyl, tetrahydrofurfuryl or pyranylmethyl. The reaction is carried out below 0° C. preferably −40 to −70° C.

3,660,417
CERTAIN 2-IMINO-5-NITROTHIAZOLINES
Peter John Islip, Hampton, England, assignor to Parke-Davis & Company, Detroit, Mich.
No Drawing. Filed Nov. 9, 1970, Ser. No. 88,169
Claims priority, application Great Britain, Mar. 11, 1970, 11,783/70
Int. Cl. C07d *91/26*
U.S. Cl. 260—306.7 6 Claims

New thiazoline compounds having the formula



where R_1 is lower alkyl, lower alkoxy, cyclopropyl, phenyl, or 2-thienyl, and R_2 is lower alkyl or cyclopropyl; and their production by reacting a thiazole with a 2-haloacetamide in the presence of a base or by reacting a 5-nitro-4-thiazoline-3-acetamide with a reactive carboxylic acid derivative in the presence of an acid catalyst. The compounds of the invention are useful as schistosomacides and trichomonacides.

3,660,418
CERTAIN 2,3,5,6-TETRAHYDROIMIDAZO[2,1-b] THIAZOLES
Robert E. Manning, Mountain Lakes, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.
No Drawing. Continuation-in-part of application Ser. No. 841,186, June 19, 1969, which is a continuation of application Ser. No. 790,853, Jan. 13, 1969. This application Mar. 16, 1970, Ser. No. 20,111
Int. Cl. C07d *99/06*
U.S. Cl. 260—306.7 11 Claims

(2,6-substituted phenyl)thiazoles, e.g., 2-(2,6-dichlorophenyl)-5,6-dihydroimidazo[2,1-b]thiazole, are prepared by treating a substituted phenylaldehyde with a substituted thiourea. The compounds are useful as hypotensives.

3,660,419
DISUBSTITUTED-5-NITROIMIDAZOLES
Robert Gordon Shepherd, South Nyack, and Jay Donald Albright, Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.
No Drawing. Filed Mar. 25, 1970, Ser. No. 22,699
Int. Cl. C07d *49/36*
U.S. Cl. 260—309 4 Claims

The preparation of 1-lower alkyl-5-nitroimidazole-2-hydrazides by reacting a 1-loweralkyl-2-cyano-5-nitroimidazole with a hydrazine or salt thereof, is described. The compounds are useful as trichomonacides and as intermediates in the preparation of nitroimidazole-antiparasitic and antibacterial activity.

3,660,420
PROCESS FOR PREPARING IMIDAZOLE-BENZYLHISTIDINE DERIVATIVES
Monohar A. Tilak, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.
No Drawing. Filed May 5, 1969, Ser. No. 822,007
Int. Cl. C07d *49/36*
U.S. Cl. 260—309 4 Claims

Process for preparing im-benzyl-histidine derivatives by treating N-protected histidine with benzyl bromide and

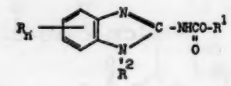
an acid scavenger in dimethylformamide or dimethylacetamide.

3,660,421
1-CARBAMOYL-2-CARBALKOXYAMINO-BENZIMIDAZOLES

Hans Osieka, Ludwigshafen, Karl-Heinz Koenig, Frankenthal, and Ernst-Heinrich Pommer, Limburgerhof, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Nov. 25, 1969, Ser. No. 879,937
Claims priority, application Germany, Dec. 2, 1968, P 18 12 100.1
Int. Cl. C07d 47/38
U.S. Cl. 260—309.2 3 Claims

New and valuable substituted benzimidazoles having the formula



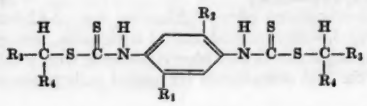
where R denotes halogen, nitro or alkyl, R^1 denotes an aliphatic radical, *n* denotes one of the integers 0, 1 and 2, R^2 deotes a carbamic acid radical or an ester radical or the radical of an acid amide and a process for controlling fungi and protecting objects against fungus attack with these compounds.

3,660,422
1,4-PHENYLENE-BIS-DITHIOCARBAMIC ACID ESTERS

Manfred Schorr, Frankfurt am Main, Walter Durckheimer, Hattersheim (Main), and Dieter Duwel, Hofheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed July 11, 1969, Ser. No. 841,111
Claims priority, application Germany, Aug. 3, 1968, P 17 95 057.1
Int. Cl. C07d 49/38
U.S. Cl. 260—309.2 1 Claim

Anthelmintically-active bis-dithiocarbamic esters of the formula



wherein R_1 and R_2 are hydrogen, halogen, alkyl having 1–6 carbon atoms, or alkoxy having 1–6 carbon atoms, R_3 is hydrogen or alkyl having 1–6 carbon atoms, and R_4 is 2-benzimidazole or 2-benzamidazole substituted with one or more halogen, lower alkyl, trifluoromethyl, lower alkoxy, nitro, sulfamido, or nitrilo groups. The esters, which are active against liver flukes for example, are prepared by reacting a salt of a corresponding bis-dithiocarbamic acid with a compound of the formula

wherein X is chlorine, bromine, or iodine.

3,660,423
2-(SUBSTITUTED BENZYL)METHYL-2-IMIDAZOLINES

Don V. Wysong, Midland, Mich., and Halbert C. White, Indianapolis, Ind., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Feb. 13, 1970, Ser. No. 11,286
Int. Cl. C07d 49/34
U.S. Cl. 260—309.6 5 Claims

2 - (substituted benzyl) - 2 - imidazoline compounds such as 2-(4-amino-3-chlorobenzyl)-2-imidazoline, and their pharmaceutically-acceptable salts such as the mono- and dihydrochlorides are prepared by classical procedures. The compounds are active as antidepressants.

3,660,424
3-PHENYL-7-[4'-CHLOROPYRAZOLYL-(1')]-COUMARINS

Guglielmo Kabas, Binningen, Basel-Land, and Reinhard Zweidler, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed June 16, 1969, Ser. No. 833,782
Claims priority, application Switzerland, June 26, 1968, 9,532/68
Int. Cl. C07d 49/18
U.S. Cl. 260—310 R 6 Claims

3 - phenyl - 7 - [4'-chloropyrazolyl-(1')]-coumarins which may bear further substituents especially at the 3'- and 5'-position of the pyrazolyl nucleus, are described as optical brighteners affording superior degree of whiteness and fluorescence number as well as better fastness to chlorite bleaching baths on such substrates as polyester and other polymeric organic materials. A preferred compound is 3-phenyl-7-[3'-methyl-4'-chloropyrazolyl-(1')]-coumarin. A method of brightening polymeric materials, e.g. fibers are films with the word compound as well as polymeric materials brightened therewith are also disclosed.

3,660,425
CERTAIN 5-AMINO-4-AROYLPYRAZOLES

Horace A. De Wald and Donald E. Butler, Ann Arbor, Mich., assignors to Parke, Davis & Company, Detroit, Mich.

No Drawing. Continuation-in-part of application Ser. No. 824,687, May 14, 1969. This application Mar. 30, 1970, Ser. No. 24,012
Int. Cl. C07d 49/20
U.S. Cl. 260—310 R 6 Claims

5-amino-4-arolypyrazole compounds, also substituted in the 1- and 3-position by lower alkyl groups, acid-addition salts thereof, and their production by (1) reacting a 4-aroyl-5-halopyrazole with ammonia or methylamine; (2) hydrolyzing a 4-aroyl-5-arylamidopyrazole; or (3) reacting a 5-amino-4-cyanopyrazole with an aryl organometallic compound. The compounds of the invention are useful as pharmacological agents that exert a depressant effect upon the central nervous system and as chemical intermediates.

3,660,426
PROCESS FOR THE PREPARATION OF 4-PYRAZOLIDINOLS

Albert Duncan Cale, Jr., Mechanicsville, and Herndon Jenkins, Richmond, Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

No Drawing. Filed June 25, 1969, Ser. No. 836,617
Int. Cl. C07d 49/02
U.S. Cl. 260—310 D 4 Claims

A novel process for preparation of 1,2-disubstituted-4-pyrazolidinols by the reaction of 1,2-disubstituted hydrazines and an epihalohydrin is described.

3,660,427
N-SULFATO-ALKYLSULFONAMIDE PHTHALOCYANINE DYESTUFFS

Gerhard Back, Loerrach, Germany, assignor to Ciba Limited, Basel, Switzerland

No Drawing. Filed Sept. 9, 1969, Ser. No. 856,471
Claims priority, application Switzerland, Sept. 24, 1968, 14,259/68
Int. Cl. C07d 27/76
U.S. Cl. 260—314.5 9 Claims

New phthalocyanine dyestuffs containing N-sulfato-alkylsulfonamide-groups with an aryl- or aralkyl radical

attached to the nitrogen atom. Valuable dyestuffs for dyeing nitrogenous textile materials pure and level shades having good general fastness properties.

3,660,428
PRODUCTION OF FORMYLMETHYLENE-PHTHALIMIDINES

Matthias Seefelder, Ludwigshafen, and Hans-Richard Mueller, Fossgoenheim, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed July 9, 1969, Ser. No. 840,512
Claims priority, application Germany, July 9, 1968, P 17 70 826.8
Int. Cl. C07d *27/50*
U.S. Cl. 260—325 **8 Claims**

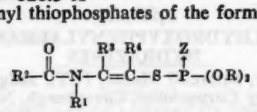
Production of formylmethylenephthalimidines by reaction of acetophenone-o-carboxylic amides with the reaction product of a formamide and an acid halide followed by hydrolysis of the reaction product. The formylmethylenephthalimidines are starting materials for the production of dyes, dyeing assistants, printing auxiliaries and pesticides.

3,660,429
β-AMIDO VINYL PHOSPHATES AND THEIR METHOD OF PREPARATION

Melancthon S. Brown, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Original application June 7, 1967, Ser. No. 644,063, now Patent No. 3,527,848. Divided and this application Nov. 10, 1969, Ser. No. 875,494
Int. Cl. C07d *27/08*
U.S. Cl. 260—326.5 A **7 Claims**

β-Amidovinyl thiophosphates of the formula



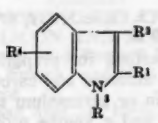
in which R is a hydrocarbyl radical, R^1 is a saturated aliphatic, cycloaliphatic or aryl radical, R^2, R^3 and R^4 are hydrogen, saturated aliphatic, cycloaliphatic or aryl radical, with the proviso that R^1 and R^2 may be joined to form an alkylene radical and Z is oxygen or sulfur. Compounds of this class are insecticidal and may be made by reacting an appropriate N-vinyl amide with a phosphorane sulfenyl halide.

3,660,430
2-SUBSTITUTED-3-ARYLINDOLES

Meier E. Freed, Philadelphia, Stanley C. Bell, Montgomery, and Peter H. L. Wei, Delaware, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Nov. 4, 1969, Ser. No. 874,047
Int. Cl. C07d *27/56*
U.S. Cl. 260—326.16 **4 Claims**

The disclosure is directed to a method of preparation of 3-arylindoles containing certain electron withdrawing groups in the 2-position by alkylating a 2-aminobenzophenone and cyclizing the product to form an indole having the structure:



(I)

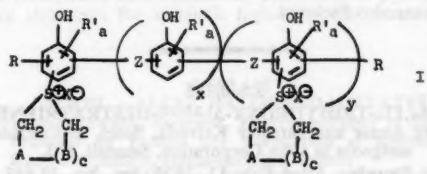
where R^1, R^2, R^3 and R^4 are as defined below. The disclosure is also directed to the intermediates and products of the process. The products are useful as central nervous system depressants in that they produce a calming effect in the host.

3,660,431
POLY(HYDROXYARYLPOLYMETHYLENE-SULFONIUM) ZWITTERIONIC MONOMERS AND SURFACE COATINGS THEREFROM

Melvin J. Hatch, Socorro, N. Mex., and Donald L. Schmidt and Hugh B. Smith, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Oct. 15, 1969, Ser. No. 866,762
Int. Cl. C07d *63/04, 65/04*
U.S. Cl. 260—332.3 R **9 Claims**

Poly(hydroxyarylpolymethylenesulfonium) salts (I), prepared by condensation of a polyphenolic resin with a cyclic sulfide, are converted into a sulfonium hydroxide inner salt (II), a reactive zwitterionic monomer. These zwitterionic monomers thermally polymerize to yield water-insoluble, thermoset resins useful as adhesives, coatings, films, and impregnants. Applied to non-porous surfaces, such as glass and wire, hard surface coatings with high impact resistance coupled with good water and chemical resistance are obtained.



I

3,660,432
RESOLUTION OF (±)(CIS-1,2-EPOXYPROPYL)-PHOSPHONIC ACID

Raymond A. Firestone, Fanwood, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Apr. 14, 1969, Ser. No. 816,042
Int. Cl. C07f *9/38*
U.S. Cl. 260—348 R **2 Claims**

(−)(Cis-1,2-expoxypropyl)-phosphonic acid, a potent antibacterial agent, is separated from a racemic mixture of the free acids by a direct resolution technique.

3,660,433
PRODUCTION OF LACTONES

Jean Margaret Mallan and Edward Leo Kay, Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

No Drawing. Continuation-in-part of abandoned application Ser. No. 866,726, Oct. 15, 1969. This application Sept. 18, 1970, Ser. No. 73,611
Int. Cl. C07d *5/06, 7/06*
U.S. Cl. 260—343 **10 Claims**

Cyclic ketones are reacted with hydrocarbon hydroperoxides to produce lactones (corresponding to the ketones) and alcohols (corresponding to the hydroperoxides). Friedel-Crafts catalysts improve selectivities to the desired products. The lactones may be further reacted to produce lactams, and the alcohols may be dehydrated to olefins.

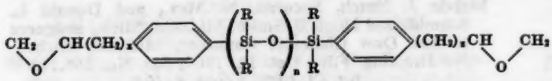
3,660,434
SILOXANE-CONTAINING EPOXIDE COMPOUNDS

William J. Patterson, Madison, Ala., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

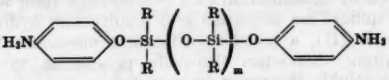
No Drawing. Original application Mar. 26, 1968, Ser. No. 715,975, now Patent No. 3,516,964, dated June 23, 1970. Divided and this application Jan. 27, 1970, Ser. No. 870,689
Int. Cl. C07f *7/08*
U.S. Cl. 260—348 SC **12 Claims**

Siloxane-containing epoxy polymers are prepared by reacting siloxane-containing epoxides with siloxane-con-

taining diamines. Both the epoxide, exemplified by the formula



and the diamine reactant



are characterized by their capability for inclusion of a controllable number of siloxane groups. The product polymers exhibit a low dielectric constant and other properties favorable to their use for electronic packaging applications. Methods for preparation of the reactant monomers are also disclosed.

3,660,435

3,16α,17α-TRIHYDROXY-$\Delta^{1,3,5(10)}$-OESTRATRIENE

Georg Anner and Jaroslav Kalvoda, Basel, Switzerland, assignors to Ciba Corporation, Summit, N.J.

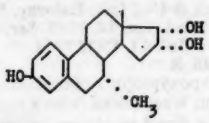
No Drawing. Filed Feb. 11, 1970, Ser. No. 10,648

Claims priority, application Switzerland, Feb. 27, 1969, 2,962/69

Int. Cl. C07c *169/20*

U.S. Cl. 260—397.5 1 Claim

The compound of the formula



Use: As oestrogenic agent or as agent for the inhibition of the gonadotropic function and ovulation or generally for controlling fertility.

3,660,436

SULFAMOYLARYL UREAS

Otto Scherer, Bad Soden, Taunus, and Gerhard Horlein, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

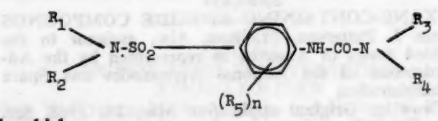
No Drawing. Continuation-in-part of application Ser. No. 651,709, July 7, 1967. This application June 9, 1970, Ser. No. 44,856

Claims priority, application Germany, July 7, 1967, F 49,708, F 49,709

Int. Cl. C07c *143/80*; C07d *29/34, 87/46*

U.S. Cl. 260—397.7 7 Claims

Compounds having desirable selective herbicidal activity are sulfamoyl ureas of the formula



in which

R_1 is alkyl of 1 to 4 carbon atoms;

R_2 is alkyl of 1 to 4 carbon atoms or methoxy; or

R_1 and R_2 together with the nitrogen on which they are substituted are pyrrolidino, piperadino or morpholino;

R_3 is methyl or ethyl;

R_4 is methyl, ethyl or methoxy;

R_5 is methyl, chloro, bromo or dichloro-difluoro-ethoxy;

and

n is 0, 1 or 2, n being at least 1 when R_1, R_2, R_3 and R_4 are all methyl.

3,660,437

PROCESS FOR PREPARING 9α-UNSUBSTITUTED 11β-CHLORO - 19-NOR STEROIDS OF THE ANDROSTANE OR PREGNANE SERIES

Leslie Stephenson and Margaret Elizabeth Hill, London, England, assignors to Glaxo Laboratories, Limited

No Drawing. Filed Jan. 15, 1970, Ser. No. 3,205

Claims priority, application Great Britain, Jan. 23, 1969, 3,971/69

Int. Cl. C07c *169/20, 169/18, 169/30*

U.S. Cl. 260—397.45 20 Claims

Process for preparing 9α-unsubstituted 11β-chloro-19-nor steroids of the androstane or pregnane series by reacting the corresponding 11α-hydroxy-19-nor steroid in an inert solvent with a source of positive chlorine, an anhydrous form of sulphur dioxide being present or added subsequently.

3,660,438

ALKYLHYDROXYPHENYLALKANOYL HYDRAZINES

Martin Dexter, Briarcliff Manor, N.Y., assignor to Ciba-Geigy Corporation, Greenburgh, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 811,664, Mar. 28, 1969. This application Apr. 13, 1970, Ser. No. 28,048

Int. Cl. C07c *103/22*

U.S. Cl. 260—404.5 6 Claims

Novel alkylhydroxyphenylalkanoyl-hydrazine compounds are prepared by reacting an ester of an alkylhydroxyphenylalkanoic acid or the corresponding alkanoic acid chloride with either hydrazine or an acyl hydrazide. The alkylhydroxyphenylalkanoyl-hydrazines are useful as stabilizers of organic materials which are subject to oxidative deterioration.

3,660,439

CATALYTIC PREPARATION OF CARBOXYLIC ACID ESTERS FROM OLEFINS, ALCOHOLS AND CARBON MONOXIDE IN THE PRESENCE OF KETONE PROMOTER

Raymond A. Schell, Berkley, Mich., assignor to Ethyl Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 671,110, Sept. 27, 1967. This application Mar. 20, 1970, Ser. No. 21,471

Int. Cl. C07c *51/14, 67/00*

U.S. Cl. 260—410.9 R 30 Claims

A process is described for preparing carboxylic acid esters from olefins, alcohols and carbon monoxide using a combination of tin or germanium salt and a platinum salt as the catalyst and a ketone promoter.

Olefins having from 8 to about 24 carbon atoms are preferred reactants. Alkyl ketones having up to 11 carbon atoms are useful promoters.

The reaction rate is unexpectedly improved by the promoter.

3,660,440

NONADECAPENTA - 1,6,9,13,18-ENE-10-METHYL CARBOXYLATE AND THE PRODUCTION THEREOF

Gunther Wilke, Paul Heimbach, and Claus Delliehausen, Mulheim (Ruhr), Germany, assignors to Studiengesellschaft Kohle mbH, Mulheim (Ruhr), Germany

No Drawing. Filed Sept. 22, 1969, Ser. No. 860,073
Claims priority, application Germany, Sept. 27, 1968, P 17 93 503.4
Int. Cl. C07c *67/00, 69/52*
U.S. Cl. 260—410.9 R 9 Claims

There is provided as a new compound nonadecapenta-1,6,9,13,18-ene-10-methyl carboxylate. This is prepared by reaction of methyl methacrylate with butadiene in the presence of zero-valent nickel or by reaction of butadiene with undecatri-1,5,10-ene-2-methyl carboxylate formed as an intermediate which may be isolated or not as desired.

3,660,441

REACTION OF AN ALDEHYDE WITH A CARBOXYLIC ACID

Donald M. Fenton, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

No Drawing. Filed Aug. 12, 1970, Ser. No. 63,313
Int. Cl. C08h *17/36*
U.S. Cl. 260—413 8 Claims

The invention comprises reacting an aldehyde and a carboxylic acid in a liquid reaction medium containing a Group VIII noble metal, preferably in complex with a biphyllic ligand, to produce an aldehyde containing the hydrocarbon radical of the reactant acid and a carboxylic acid containing the hydrocarbon radical of the aldehyde. A typical process comprises reacting ethanal with stearic acid to produce octadecanal. The invention has particular utility in converting lower aldehydes to higher and more valuable aldehydes.

3,660,442

ORGANOTIN MERCAPTOACID ESTERS AND THEIR METHOD OF PREPARATION

Jerome H. Ludwig, Shaker Heights, Ohio, assignor to Synthetic Products Company, Cleveland, Ohio

No Drawing. Filed Sept. 11, 1970, Ser. No. 71,353
Int. Cl. C07f *7/22*
U.S. Cl. 260—429.7 14 Claims

Pure or substantially pure condensation products of diorganotin bis (thioglycollate esters) which may be represented by the formula:

$$R_2Sn(SCH_2COO\cdot R')_2$$

wherein R and R' are monovalent hydrocarbon radicals. These condensation products are characterized by their freedom or substantial freedom from undesired organotin mercaptoacetates and other esters or alcohols.

A method of preparing organotin mercaptoacid esters by continuously passing a reaction mixture of a mercaptocarboxylic acid ester and organotin compound through a heat exchange zone and continuously withdrawing the desired condensation product from the zone. The method disclosed also provides for removal of by-product water.

3,660,443

PROCESS FOR THE ALKYLATION OF HALOGENATED SILICON AND TIN COMPOUNDS

Jean Boissieras, Lyon, and Bernard Delarue and Marcel Lefort, Rhone, France, assignors to Rhone-Poulenc S.A., Paris, France

No Drawing. Filed May 28, 1968, Ser. No. 732,536
Claims priority, application France, May 31, 1967, 108,623
Int. Cl. C07f *7/22, 7/02*
U.S. Cl. 260—429.7 10 Claims

Silicon and tin derivatives containing halogen directly attached to silicon or tin respectively are alkylated by reaction with an alkyl zinc derivative in a hexaalkylphosphoryltriamide or an N,N-dialkylamide. The alkyl zinc derivative may itself be prepared by reaction of zinc with an alkyl halide in the presence of iodine or with an alkyl iodide in a hexaalkylphosphoryltriamide.

3,660,444

PROCESS FOR THE PRODUCTION OF PYROLYSATES AND THEIR USE AS STABILIZERS

Peter Kartschmaroff, Waldstrasse 6, Arlesheim, Basel-Land, Switzerland; Paul Moser, Hauensteinstrasse 108, Basel, Switzerland, and Kurt Berger, Grabenmattweg 9, Allschwil, Basel-Land, Switzerland

No Drawing. Filed July 16, 1970, Ser. No. 55,615
Claims priority, application Switzerland, July 31, 1969, 11,650/69
Int. Cl. C07f *15/04;* C08f *45/62*
U.S. Cl. 260—439 R 8 Claims

Pyrolysates are produced by heating the nickel salts of phosphonic acid semiesters. The obtained pyrolysates are stabilizers for synthetic high-molecular materials.

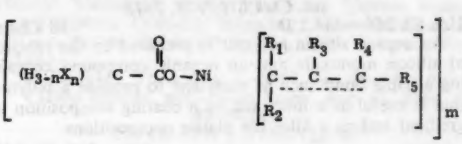
3,660,445

NICKEL π-ALLYL HALOGENOACETATES

Francois Dawans, Bougival, France, assignor to Institut Francais du Petrole des Carburants et Lubrifiants, Rueil Malmaison, Hauts-de-Seine, France

No Drawing. Filed Aug. 19, 1968, Ser. No. 753,769
Claims priority, application France, Aug. 23, 1967, 118,816
Int. Cl. C07f *15/04*
U.S. Cl. 260—439 R 7 Claims

The present disclosure is directed to nickel π-allyl halogenoacetates complying with the general formula:



wherein X is a halogen, *n* an integer from 1 to 3, R_1, R_2, R_3, R_4 and R_5, are selected from the group consisting of hydrogen, allyl, cycloalkyl, aralkyl and aryl, or at least two of R_1, R_2, R_3 and R_4 are part of a cycle, and *m* is an integer equal to 1 or 2. The compounds of the present disclosure are effective as catalysts in the polymerization of unsaturated organic compounds.

3,660,446

NICKEL MONO-ALKYLPHOSPHITES AND DERIVATIVES

Jonathan T. Carriel, Ridgewood, N.J., and Joseph F. Anzenberger, St. Louis, Mo., assignors to The International Nickel Company, Inc., New York, N.Y.

No Drawing. Continuation of application Ser. No. 537,010, Mar. 24, 1966. This application Mar. 14, 1969, Ser. No. 808,378
Int. Cl. C07f *15/04*
U.S. Cl. 260—439 R 5 Claims

Directed to a class of nickel compounds generally formulated as $Ni[(OP)(OR)(OH)]_2$ and

$$L_2Ni[(OP)(OR)(OH)]_2$$

wherein R is an alkyl group containing from about 1 to about 12 carbon atoms and L is a ligand of the electron donor type coordinated to the nickel and to a method for preparing the compounds. The compounds have utility as nematocides.

3,660,447

PROCESS OF OXIDIZING ALUMINUM ALKYLS

Hoyt J. Cragg and Doyle A. Nolen, Baton Rouge, La., assignors to Ethyl Corporation, New York, N.Y.

No Drawing. Filed July 18, 1969, Ser. No. 843,206
Int. Cl. C07f 5/06
U.S. Cl. 260—448 AD 12 Claims

Titanium tetrachloride and certain related materials are disclosed as being useful adjuvants for the oxidation of alkyl aluminum alkoxide materials to produce trialkoxy aluminum compounds.

3,660,448

REACTION PRODUCTS OF SILICON MONOXIDE AND ORGANIC COMPOUNDS HAVING ACTIVE HYDROGEN ATOMS AND METHODS OF MAKING THE SAME

Erich T. Schaschel, Toledo, Ohio, assignor to Owens-Illinois, Inc.

No Drawing. Filed Mar. 3, 1970, Ser. No. 16,234
Int. Cl. C07f 7/04, 7/08, 7/18
U.S. Cl. 260—448.2 N 18 Claims

Reaction products of silicon monoxide and active hydrogen containing organic compounds such as alcohols and amines are provided. The products, which are organo silicon polymers, are useful in coating compositions, for fillers in ceramic and plastic compositions and as stop-cock greases.

3,660,449

REACTION PRODUCTS OF SILICON MONOXIDE AND ACETYLENES AND METHODS OF PREPARING THE SAME

Erich T. Schaschel, Toledo, Ohio, assignor to Owens-Illinois, Inc.

No Drawing. Filed Mar. 3, 1970, Ser. No. 16,238
Int. Cl. C07f 7/08, 7/18
U.S. Cl. 260—448.2 D 18 Claims

An organo silicon polymer is prepared by the reaction of silicon monoxide and an organic compound containing a triple bond such as acetylene to provide a polymer that is useful as a lubricant, as a coating composition ingredient and as a filler for plastic compositions.

3,660,450

REACTION PRODUCTS OF SILICON MONOXIDE AND AROMATIC COMPOUNDS SUCH AS BENZENE AND METHODS OF MAKING THE SAME

Peter L. Timms, Bristol, England, assignor to Owens-Illinois, Inc.

No Drawing. Filed Mar. 3, 1970, Ser. No. 16,268
Int. Cl. C07f 7/08, 7/18
U.S. Cl. 260—448.2 D 17 Claims

An organo silicon polymer is prepared by the reaction of silicon monoxide and an aromatic compound such as benzene to provide a polymer that is useful as a lubricant, as an ingredient for a coating composition and as a filler for plastic compositions.

3,660,451

REACTION PRODUCTS OF SILICON MONOXIDE AND ORGANIC HALIDES AND METHODS OF MAKING THE SAME

Erich T. Schaschel, Toledo, Ohio, assignor to Owens-Illinois, Inc.

No Drawing. Filed Aug. 24, 1970, Ser. No. 66,577
Int. Cl. C07b 7/08, 7/12
U.S. Cl. 260—448.2 R 21 Claims

Organo silicon polymers are prepared by the reaction of silicon monoxide and an organic monohalide such as 1-chloro-butane to provide a polymer that is useful as a lubricant, stop-cock grease and as a filler for ceramic and plastic compositions.

3,660,452

SILOXANE AMINO HYDROXY SULFONATES

Edward Lewis Morehouse, New City, N.Y., assignor to Union Carbide Corporation

No Drawing. Filed Apr. 30, 1968, Ser. No. 725,524
Int. Cl. C07f 7/02
U.S. Cl. 260—448.2 N 8 Claims

This invention relates to novel siloxanes having a sulfonate group linked to silicon through an organic group having an amino nitrogen and a hydroxyl substituent. The novel siloxanes are surfactants useful as additives to aqueous liquids (such as aqueous protein fire fighting compositions) to promote foaming, as wetting agents for organic surfaces (such as polyethylene) and as sequestering agents for metals (such as copper). The novel siloxanes are produced by reacting a primary or secondary amine sulfonate with an epoxy-organosiloxane.

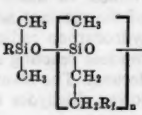
3,660,453

FLUOROSILICONE HYDRAULIC FLUIDS

Eugene D. Groenhof and Harry M. Schiefer, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

No Drawing. Continuation-in-part of application Ser. No. 564,742, July 13, 1966. This application Jan. 10, 1969, Ser. No. 790,443
Int. Cl. C07f 7/02
U.S. Cl. 260—448.2 R 4 Claims

Fluorosilicone fluids of the formula



in which

R and R′ are aralkyl radicals containing no more than 3 aliphatic carbon atoms are disclosed as improved hydraulic fluids. Exemplary of such a fluid is 3,3,3-trifluoropropylmethylpolysiloxane having a viscosity of 40 cs. at 77° F. which is endblocked with 2-phenylethyldimethylsiloxy units.

3,660,454

PROCESS OF MAKING AMINO SUBSTITUTED ORGANOSILICON COMPOUNDS AND THE COMPOUNDS MADE THEREBY

Gerald A. Gornowicz, Madison, Wis., and Samuel R. Wendel, Missoula, Mont., assignors to Dow Corning Corporation, Midland, Mich.

No Drawing. Filed Aug. 19, 1969, Ser. No. 851,486
Int. Cl. C07f 7/02
U.S. Cl. 260—448.8 R 5 Claims

Sulfur-substituted aminosilanes and siloxanes, and N-substituted aminosilanes and siloxanes are made by reacting silicon compounds having the group ≡SiR′SH with ethylene imine or N-substituted ethylene imines to give alkoxysilanes and siloxanes having the grouping

$$\equiv SiR'CH_2CH_2NHR''$$

The reaction is enhanced by the presence of an alcohol or zinc chloride. The products are useful as coupling agents between glass and phenolic resins.

3,660,455

PREPARATION OF ORGANIC PERCHLORATES

David M. Hoffman, Chester, Pa., assignor to Sun Oil Company, Philadelphia, Pa.

No Drawing. Filed Mar. 31, 1970, Ser. No. 24,390
Int. Cl. C07c 71/00
U.S. Cl. 260—453 R 20 Claims

Hydrocarbyl perchlorates are prepared by contacting certain kinds of feed reactants with perchloric acid in an

emulsion comprising a strong sulfuric acid phase and an organic phase comprising an inert organic solvent. The feed reactants can be alkenes, cycloalkenes, alkanols, cycloalkanols, and certain aralkenes and aralkanols. The perchloric acid can be generated in situ in the mixture by reaction of a perchlorate metal salt with the sulfuric acid. The hydrocarbyl perchlorate products have utility as detonatable sensitizers for explosives and as alkylating agents.

3,660,456

STABILIZED ISOCYANATE COMPOSITION

Kenji Naito, Hiroshi Okudo, and Katsuhiko Ogino, Toyonaka, Michio Tanaka, Suita, Yoshio Kamatani, Osaka, Hiroshi Mukai, Suita, and Tatsuro Takeuchi, Ibaragi, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

No Drawing. Filed Dec. 24, 1968, Ser. No. 786,729

Claims priority, application Japan, Dec. 28, 1967, 43/84,199

Int. Cl. C07c *119/04*

U.S. Cl. 260—453 SP **15 Claims**

Organic isocyanates stabilized against deterioration or discoloration during storage by a stabilizing amount of any one of the following compounds:

(a) a substituted urea derivative of the formula X—NHCONH—Y wherein X is nitro, cyano, acetyl, chlorinated acetyl, thioacetyl, toluenesulfonyl or benzenesulfonyl and Y is hydrogen, phenyl, or n-butyl,

(b) a cyclic ureide compound selected from the group consisting of parabanic acid, barbituric acid, barbital, thiobarbital, phenobarbital, uracil, 5-methyluracil, isocyanuric acid, benzyl isocyanurate, dibenzyl isocyanurate, n-butyl isocyanurate, di-n-butyl isocyanurate, chlorisocyanurate, dichlorisocyanurate, orotic acid, orotic acid ethyl ester, orotic acid phenyl ester, butanimide, phthalimide, and o-benzoic sulfimide.

(c) a compound shown by the formulas:

R^1CXNHR^3

$R^2(CONHR^3)_2$

$(CONHR^3)_2$ or

$R^4SO_2NHR^3$

wherein X is O or S; R^1 and R^3, which may be the same or different, are alkyl groups having 1 to 4 carbon atoms, phenyl groups or hydrogen, and R^4 is an alkyl group having 1 to 4 carbon atoms or a phenyl group, said alkyl and phenyl groups which may be substituted by one or more chlorines, $—NO_2$, —CN, an alkyl having 1 to 2 carbon atoms or an alkoxy having 1 to 2 carbon atoms; and R^2 is a di-valent hydrocarbon residue selected from methylene, ethenylene and phenylene,

(d) sulfur and

(e) hydrogen sulfide.

3,660,457

5-CYANO-A-NORPREGNANE-2-ONE DERIVATIVES

Seymour D. Levine, North Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Original application June 19, 1968, Ser. No. 738,091, now Patent No. 3,526,642. Divided and this application May 14, 1970, Ser. No. 48,726

Int. Cl. C07c *121/46*

U.S. Cl. 260—464 **3 Claims**

This disclosure relates to pregnanes having an oxygen atom in the 2-position and a cyano radical at the 5-position. These compounds possess anti-androgenic activity.

3,660,458

PROCESS FOR PREPARING AROMATIC ISOCYANATES FROM AROMATIC AZO AND/OR AROMATIC AZOXY COMPOUNDS

Samuel I. Trotz, Orange, Thomas J. Hurley, Jr., Madison, and Ehrenfried H. Kober, Hamden, Conn., assignors to Olin Mathieson Chemical Corporation

No Drawing. Filed Jan. 21, 1969, Ser. No. 792,836

Int. Cl. C07c *119/04*

U.S. Cl. 260—453 PC **11 Claims**

The process for preparing an organic isocyanate by reacting an organic azo and/or an organic azoxy compound with carbon monoxide in the presence of a noble metal based catalyst at an elevated temperature and elevated pressure.

3,660,459

BORATE QUATERNARY AMMONIUM COMPOUNDS DERIVED FROM BORATE ESTERS OF AMINO SECONDARY ALKANOLS

Graham K. Hughes, Hackettstown, N.J., assignor to Ashland Oil, Inc., Houston, Tex.

No Drawing. Original application May 16, 1966, Ser. No. 550,157, now Patent No. 3,465,026, dated Sept. 2, 1969. Divided and this application Apr. 23, 1969, Ser. No. 818,833

Int. Cl. C07c *141/04*

U.S. Cl. 260—459 **7 Claims**

Quaternary ammonium salts of borate esters of 1-dialkylamino-2-alkanols are disclosed; such compounds having particular utility as fabric softeners and sanitizers.

3,660,460

PROCESS FOR PREPARING N,N-BIS-CYANOETHYLATED DERIVATIVES OF ALIPHATIC PRIMARY AMINE BRANCHED AT THE α-POSITION

Hideaki Munakata, Kazuo Watanabe, Akitada Osako, and Rintaro Urakabe, Shiga-ken, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Toyo Spinning Co., Ltd.)

No Drawing. Filed Aug. 6, 1969, Ser. No. 848,082

Claims priority, application Japan, Aug. 19, 1968, 43/59,348

Int. Cl. C07c *121/28, 121/46*

U.S. Cl. 260—464 **6 Claims**

Process for preparing the N,N-bis-cyanoethylated derivative of an aliphatic primary amine branched at the α-position which comprises reacting an aliphatic primary amine of the formula:

wherein R′ and R″ are each a lower alkyl group or are linked together to represent a lower alkylene group or its N-monocyanoethylated derivative with acrylonitrile in the presence of an acidic catalyst to give the corresponding N,N-biscyanoethylated compound, which is useful as the starting material in the production of an easily dyeable polyamide fiber.

3,660,461

N-CYCLOALKYL-N′-CYANOALKYL ALKOXYBENZAMIDES

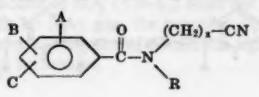
William D. Roll, Toledo, Ohio, assignor to The University of Toledo, Toledo, Ohio

No Drawing. Filed May 5, 1969, Ser. No. 822,029

Int. Cl. A61k *27/00*; C07c *121/78*

U.S. Cl. 260—465 D **5 Claims**

Simultaneously acting central nervous system (CNS) depressants and blood pressure depressors of the formula



wherein A, B, and C are selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, and halogen radicals at least one of which is an alkoxy or a halogen radical; wherein x is a whole number from one to three, and wherein R is selected from the group consisting of cycloaliphatic radicals containing between three and seven carbon atoms.

3,660,462

N-ACYL-DICYANOCARBONYL-PHENYL-HYDRAZONES

Karl Heinz Buchel, Wuppertal-Elberfeld, Ingeborg Hammann, Cologne, Gunter Unterstenhofer, Opladen, and Ferdinand Grewe, Burscheid, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Dec. 9, 1969, Ser. No. 883,631

Claims priority, application Germany, Dec. 12, 1968, P 18 14 252.4

Int. Cl. A01n *9/12, 9/20;* **C07c** *121/78*

U.S. Cl. 260—465 D **10 Claims**

N-acyl-dicyanocarbonyl-phenyl - hydrazones, i.e. 1-(α-cyano-α-cyano)-carbonyl-2 - (alkyl, chloroalkyl, alkenyl, alkoxy, cycloalkyloxy, alkenyloxy, phenyl, phenoxy and dialkylamino)-carbonyl and thiocarbonyl-2-[(mono, and same and mixed di and tri, -chloro, -fluoro, -trifluoromethyl, -alkyl, -alkoxy, -nitro and -acetylamino)-phenyl]-hydrazones, which possess arthropodicidal, especially acaricidal and insecticidal, as well as fungicidal properties and which may be produced by conventional methods.

3,660,463

SYNTHESIS OF AMINOMETHYLENE-MALONONITRILE

Gerald Myer Jaffe, Verona, and William Richard Rehl, Upper Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Continuation-in-part of abandoned applications Ser. No. 406,591, Oct. 26, 1964, and Ser. No. 476,651, Aug. 2, 1965. This application Sept. 24, 1965, Ser. No. 490,105

Int. Cl. C07c *121/42*

U.S. Cl. 260—465.5 **7 Claims**

Aminomethylenemalononitrile is prepared by condensing a salt of formamidine with malononitrile in the presence of a weak base, said weak base being present in an amount of least about 0.5 mole per mole of malononitrile.

3,660,464

TRI-IODINATED DIAMINOBENZOIC ACID DERIVATIVES

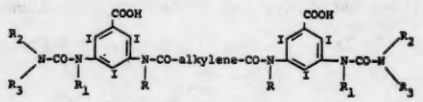
Jack Bernstein and Kathryn Alice Losee, New Brunswick, N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Filed June 19, 1970, Ser. No. 47,908

Int. Cl. C07c *127/16*

U.S. Cl. 260—470 **6 Claims**

This invention relates to new iodinated diaminobenzoic acid derivatives of the general formula



and to salts and lower alkyl esters of these compounds, which are useful as radiopaque agents.

3,660,465

ETHYNYLENE CONTAINING N-PHENYL CARBAMATES

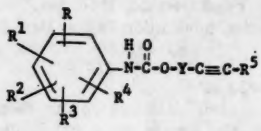
Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 717,970, Apr. 1, 1968. This application Aug. 1, 1969, Ser. No. 846,920

Int. Cl. C07c *125/06*

U.S. Cl. 260—471 C **2 Claims**

Compounds of the formula



in which R is
- (a) hydrogen,
- (b) alkyl,
- (c) nitro,
- (d) halo,
- (e) hydroxy,
- (f) alkoxy,
- (g) alkylthio, or
- (h) phenyl,

R^1 is
- (a) hydrogen,
- (b) alkyl,
- (c) nitro,
- (d) halo,
- (e) hydroxy, or
- (f) alkoxy,

R^2 is
- (a) hydrogen,
- (b) methyl,
- (c) halo, or
- (d) alkoxy,

R^3 is
- (a) hydrogen,
- (b) methyl, or
- (c) halo,

R^4 is
- (a) hydrogen,
- (b) methyl, or
- (c) halo,

Y is a divalent lower alkenyl, lower alkynyl or lower alkyl radical either straight or branched chain, and R^5 is an alkyl, cycloalkyl or alkenyl group and their use as acaricides and insecticides.

3,660,466

2,4,6-TRIIODOBENZOIC ACID DERIVATIVES

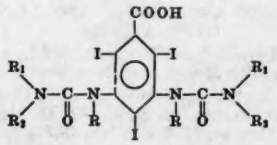
Jack Bernstein and Kathryn Alice Losee, New Brunswick, N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Filed June 19, 1970, Ser. No. 47,903

Int. Cl. C07c *127/16*

U.S. Cl. 260—471 R **5 Claims**

Compounds having the formula



(I)

where R and R_1 are hydrogen or lower alkyl, R_2 is lower alkyl, as well as salts and lower alkyl esters of these compounds are useful as diagnostic agents.

3,660,467

AROMATIC ESTERS OF ALIPHATIC DICARBOXYLIC ACIDS

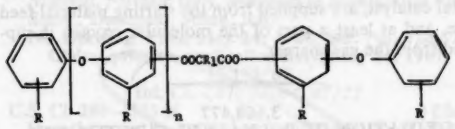
Patrick Gould, Woodham, near Weybridge, John Henry Alexander Row, Rochester, Kent, and Stanley George Rudston, West Molesey, England, assignors to The British Petroleum Company Limited

No Drawing. Continuation of application Ser. No. 382,964, July 15, 1964. This application Oct. 2, 1969, Ser. No. 866,077

Int. Cl. C07c *69/34*

U.S. Cl. 260—479 S 10 Claims

Phenoxy phenyl esters of carboxylic acids are provided which are employed as synthetic lubricants and heat transfer fluids and have the following general formula:



wherein:

R is a member selected from the group consisting of hydrogen atoms and alkyl groups having from 1–4 carbon atoms,

R_1 is a saturated divalent hydrocarbon group having from 2–14 carbon atoms, and

n is 0 or 1.

Furthermore, three methods of preparing the above esters are provided. The first method comprises a conventional esterification reaction of a phenolic reactant with one or more acids. The second method reacts the phenolic reactant or an alkali metal salt thereof with an acid halide. The third and last method trans-esterifies the phenolic reactant with a dimethyl ester.

3,660,468

CARBOXY-PERESTERS

Wilbur H. McKellin, Buffalo, N.Y., assignor to Pennwalt Corporation

No Drawing. Filed May 7, 1968, Ser. No. 727,379

Int. Cl. C07c *73/00*

U.S. Cl. 260—488 F 7 Claims

Certain compounds including a free carboxyl group and a perester group are efficient free radical generators for polymerization of monomers in aqueous medium. For example: Emulsion polymerization of styrene, vinyl chloride, and methyl methacrylate using t-butyl peroxymethylsuccinic acid and t-butyl peroxy-2-carboxybenzoate.

3,660,469

BIS-TRIIODOISOPHTHALAMIC ACID COMPOUNDS

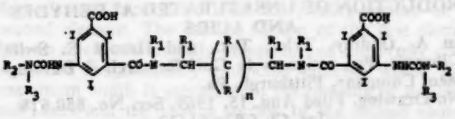
Jack Bernstein and Kathryn A. Losee, New Brunswick, N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Filed Aug. 4, 1969, Ser. No. 847,449

Int. Cl. C07c *103/24*

U.S. Cl. 260—501.11 9 Claims

This invention relates to new bis-triiodoisophthalamic acid compounds having the formula



and to salts and lower alkyl esters of these compounds. These compounds are useful as radiopaque agents.

3,660,470

LIME SOAP DISPERSANTS AND COMPOSITIONS CONTAINING THEM

David Graham Spencer Hirst, Whitley Bay, England, assignor to The Procter & Gamble Company, Cincinnati, Ohio

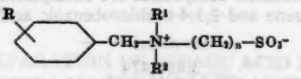
No Drawing. Filed Sept. 22, 1970, Ser. No. 74,496

Claims priority, application Great Britain, Oct. 1, 1969, 48,278/69

Int. Cl. C07c *143/14*

U.S. Cl. 260—501.12 6 Claims

Alkylbenzyl di-lower alkylammonio alkane-1 sulfonates having the formula



wherein R is a straight or branched chain alkyl group having 8 to 24, preferably 10 to 18, carbon atoms; R^1 is an alkyl group having 1 to 6 carbon atoms; R^2 is an alkyl group having 1 to 6 carbon atoms; and *n* is an integer of from 1 to 4, preferably 2 or 3. These compounds have excellent scum-dispersant properties and are effective in solid, granular, bar, or liquid soap compositions to reduce lime-scum formation. Compositions comprising higher fatty acid soaps and the alkylbenzyl di-lower alkylammonio alkane-1 sulfonates are described. Desirable results are obtained when the ratio of soap to zwitterionic, by weight, is from 3:1 to 100:1.

3,660,471

PROCESS FOR PREPARATION OF SULPHONIC ACIDS

Toshimi Sawano, Osaka-fu, Hiroshi Koike, Takatsuki-shi, Naoji Kurata, Nishinomiya-shi, and Yukio Okuda, Toyonaka-shi, Japan, assignors to Nippon Shokubai Kagaku Kogyo Co. Ltd., Osaka, Japan

No Drawing. Filed Oct. 28, 1968, Ser. No. 771,371

Claims priority, application Japan, Nov. 4, 1967, 42/70,666

Int. Cl. C07c *143/02*

U.S. Cl. 260—513 R 2 Claims

A process for preparation of monosulphonic acids at high selectivity which comprises reacting straight-chain paraffinic hydrocarbons having 10 to 30 carbon atoms with sulphur dioxide and oxygen to produce the corresponding sulphonic acids, characterised in that the reaction is carried out under such conditions as to bring about a homogeneous reaction liquid phase, i.e., the concentration of sulphur dioxide in the reaction liquid phase being 7 to 23% by weight, the reaction temperature being 17 to 37° C., and the conversion of the straight-chain paraffinic hydrocarbon being 1 to 7%.

3,660,472

PROCESS FOR PREPARING LIGHT-COLORED, LONG-CHAIN OLEFIN SULFONATES

Kanji Majima and Kensuke Takei, Wakayama-shi, and Masayuki Oku, Kainan-shi, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

No Drawing. Filed Dec. 4, 1969, Ser. No. 882,277

Claims priority, application Japan Dec. 8, 1968, 43/88,787

Int. Cl. C07c *143/16*

U.S. Cl. 260—513 4 Claims

Light-colored, long-chain olefin sulfonates are prepared by preliminarily treating long-straight-chain olefins (8–24 C.) with a small amount of SO_3 (0.5–20 mol percent based on the olefins) diluted with an inert gas and the resulting colored substances are removed. The remainder of the long-straight-chain olefins are treated with a larger amount of SO_3 (1.0–1.3 mols per 1 mol of olefin) diluted with an inert gas, the reaction product is neutralized and then hydrolyzed to obtain the light-colored, long-chain olefin sulfonates.

3,660,473

PREPARATION OF TRI- AND TETRAHALO-SUBSTITUTED AROMATIC COMPOUNDS

Louis Schmerling, Riverside, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Apr. 28, 1969, Ser. No. 819,933
Int. Cl. C07c *63/10*
U.S. Cl. 260—515 A 10 Claims

Tri- and tetrahalo-substituted aromatic compounds are prepared by reacting a pentahalo-2,4-pentadienoic acid with an olefinic hydrocarbon at elevated temperatures and pressures to produce the desired compound. The trihalo-substituted aromatic compounds are exemplified by 1,2,3-trichlorobenzene and 2,3,4-trichlorobenzoic acid.

3,660,474

RESOLUTION OF AMMONIUM-N-ACETYL-DL-α-AMINOPHENYLACETATE AND PREPARATION THEREOF

Ichiro Chibata, Suita-shi, Shigeki Yamada, Toyonaka-shi, and Masao Yamamoto, Kyoto-fu, Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

No Drawing. Filed Oct. 21, 1969, Ser. No. 868,229
Claims priority, application Japan, Mar. 28, 1969, 44/23,954
Int. Cl. C07c *103/32*
U.S. Cl. 260—518 R 16 Claims

Seed crystals of one optically active enantiomer of ammonium N-acetyl-DL-α-aminophenylacetate are added to a supersaturated solution of ammonium N-acetyl-DL-α-aminophenylacetate. Crystallization of said one optically active enantiomer results. The crystals are recovered. Alternatively, crystals of said one optically active enantiomer may be added to a hot solution of the N-acetyl-DL-α-aminophenylacetate to produce a supersaturated solution. The solution is then cooled to crystallize out said one optically active enantiometer. A combination of these two alternative procedures can be utilized. The recovered optically enantiomer ammonium N-acetyl-DL-α-aminophenylacetate can be reacted with an acid to produce optically active α-aminophenylacetic acid.

3,660,475

PHENOXYALKANOYLAMIDOOXYALKANOIC COMPOUNDS

Ralph P. Neighbors, Olathe, Kans., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

No Drawing. Division of application Ser. No. 759,761, Sept. 13, 1968, now Patent No. 3,543,305, which is a continuation-in-part of application Ser. No. 668,180, Sept. 15, 1967, now Patent No. 3,520,674, which in turn is a continuation-in-part of application Ser. No. 374,813, June 12, 1964, now Patent No. 3,457,063. This application Jan. 21, 1970, Ser. No. 4,781
The portion of the term of the patent subsequent to May 26, 1984, has been disclaimed
Int. Cl. C07c *101/06*
U.S. Cl. 260—519 7 Claims

Both broadleaf weeds and common noxious grasses such as yellow and green foxtail are combated in fields of small grains such as wheat, barley and oats by use of phenoxyalkanoylaminooxyalkanoic acids and derivatives thereof, for example, 2 - phenoxypropanoylaminooxy acetic acid, formulated either as free acid or salts.

3,660,476

METHOD FOR THE PREPARATION OF TEREPHTHALIC ACID

Yataro Ichikawa, Gentaro Yamashita, and Yuichi Akachi, Iwakuni-shi, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Oct. 30, 1968, Ser. No. 771,877
Int. Cl. C07c *63/02*
U.S. Cl. 260—524 R 5 Claims

An apparatus for continuous production of terephthalic acid from p-dialkylbenzene and molecular oxygen with high utilization ratio of said oxygen, which comprises a reactor with its bottom tapered downwards, the reactor being provided with a gas exhaust pipe at an upper part, an exit for the reaction product at the bottom portion, and a starting material feed pipe at a suitable position therebetween; a gas sparger for supplying molecular oxygen which opens into the reactor at the bottom portion; a draft tube with open top and bottom, which is positioned above the gas sparger; and a gas distributor for dispersing the molecular oxygen into the reactor, which is positioned above and appropriately spaced from the draft tube; furthermore the reactor being provided with a heating and/or cooling means for maintaining the reaction material in the reactor at a temperature of 80–150° C.; whereby p-dialkylbenzene, an aliphatic mono-carboxylic acid and a heavy metal catalyst, are supplied from the starting material feed pipe, and at least a part of the molecular oxygen is supplied from the gas sparger.

3,660,477

OXIDATION OF POLYALKYL-SUBSTITUTED AROMATICS IN ALKALINE MEDIA

Dieter H. Otterbach, Haddonfield, and John W. Porter, Brooklawn, N.J., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed July 2, 1969, Ser. No. 838,689
Int. Cl. C07c *63/02*
U.S. Cl. 260—524 R 12 Claims

One alkyl group of polyalkyl-substituted aromatic compounds is selectively oxidized to a carboxyl group with molecular oxygen in the presence of aqueous alkali metal bicarbonate and a catalytic amount of iodine and iodide ions at a temperature of about from 160 to 230° C., the pH of the reaction mixture being less than about 10, and said reaction mixture containing sufficient bicarbonate to neutralize carboxyl groups as they are formed.

3,660,478

CYCLIC RECRYSTALLIZATION PROCESS

John Nasser, New Canaan, Conn., assignor to Mobil Oil Corporation

Continuation-in-part of application Ser. No. 576,754, Sept. 1, 1966. This application Mar. 7, 1969, Ser. No. 805,187
Int. Cl. C07c *51/42, 51/48*
U.S. Cl. 260—525 18 Claims

Continuous cyclic leaching and/or recrystallization of a slurry of an excess of solid terephthalic or another benzene carboxylic acid in a saturated solution thereof in a solvent (acetic acid) at an elevated temperature level (285–580° F.) wherein slurry recirculating in a loop system is alternately cooled 1 to 20° F. to recrystallize 1 to 10% of the solute and similarly heated elsewhere to dissolve an equivalent amount of solids in 10 or more heating-cooling cycles by recirculating the slurry in a ratio of at least 10:1 based on the amount of treated slurry being withdrawn continuously. Direct or indirect heat transfer may be used for either heating or cooling, as unheated charge slurry may provide direct cooling or the charge may be preheated for direct heating of the recirculating slurry; also the product slurry may be cooled and then recycled to the loop as a direct coolant.

3,660,479

PRODUCTION OF UNSATURATED ALDEHYDES AND ACIDS

John A. Ondrey, Tyler, Tex., and Harold E. Swift, Gibsonia, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed Aug. 15, 1969, Ser. No. 850,628
Int. Cl. C07c *51/32*
U.S. Cl. 260—530 N 10 Claims

A method of oxidizing propylene and isobutene to the corresponding unsaturated aldehydes and acids and for

oxidizing the unsaturated aldehydes of propylene and isobutene to the corresponding unsaturated acids by the vapor phase reaction with molecular oxygen in the presence of a catalyst of cobalt molybdate promoted with a composition of lead, tellurium and oxygen. Propylene is converted to acrolein and acrylic acid and acrolein is converted to acrylic acid.

3,660,480

CATALYST FOR THE OXIDATION OF OLEFINS TO UNSATURATED ALDEHYDES AND UNSATURATED ACIDS

Gianfranco Pregaglia, Milan, Marco Agamennone, Novara, Nicola Santangelo, Milan, and Guglielmo Matzuzi, Novara, Italy, assignors to Montecatini Edison S.p.A., Donegani, Milan, Italy

No Drawing. Filed May 14, 1968, Ser. No. 728,877
Claims priority, application Italy, May 16, 1967, 16,133/67
Int. Cl. C07c *57/04, 47/22*
U.S. Cl. 260—533 N 9 Claims

Propylene and isobutene are oxidized in vapor phase to unsaturated aldehydes and unsaturated acids by means of a catalyst essentially constituted by a monophase system based on molybdenum anhydride the crystalline lattice of which is altered due to the random substitution of some of the molybdenum atoms by atoms of a metal Ms selected from nickel, manganese and cobalt, the atomic ratio Ms/Mo being equal to 1:9.

3,660,481

PROCESS FOR THE PREPARATION OF CARBOXYLIC ACIDS

Jacques Boichard, Irigny, Rhone, and Bernard Brossard, Michel Gay, and Raymond Janin, Lyon, Rhone, France, assignors to Rhone-Poulenc S.A., Paris, France

Filed Oct. 22, 1968, Ser. No. 769,664
Claims priority, application France, Oct. 25, 1967, 125,843
Int. Cl. C07c *53/08, 51/16*
U.S. Cl. 260—533 R 3 Claims

Mixtures of aliphatic carboxylic acids consisting mainly of acetic and propionic acids, with some oxalic acid, are obtained by oxidising 1-butene, alone or with 2-butene, with nitric acid.

3,660,482

JOINT FOR SHEET ELEMENTS

Eduardo Delfin Elizalde, Esmeralda 135, Buenos Aires, Argentina

Filed May 16, 1969, Ser. No. 825,185
Claims priority, application Argentina, May 28, 1968, 214,388, 214,389
Int. Cl. E04d *1/06, 1/34*
U.S. Cl. 52—537 10 Claims

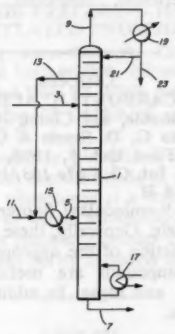
A structure formed of at least two sheet elements, each having a joining section, with the joining section of the first element superposed over the joining section of the second element. The joining section of the first element has an open substantially complete and uniformly cross-sectioned longitudinally extending channel whose inner maximum width is greater than the opening of the channel insert and the joining section of the second element has a channel insert at least partially received in the channel of the first element to form an assembly of the elements. A clamping plate is positioned in the channel of the assembled elements to provide transverse clamping pressure between the wall of the channel insert and the walls of the channel of the first element. The clamping plate is a generally oblong body formed with two diagonally opposed rounded off corners, the greatest width of the plate not exceeding the width of the opening of the channel and the length of the plate being greater than the maximum inner width of the channel of the assembly before the plate is positioned in the channel, the plate providing the transverse clamping pressure when the length of the plate extends transversely of the channel of the assembly.

3,660,483

SEPARATION OF FORMIC ACID FROM ACETIC ACID

Charles C. Hobbs and John A. Bedford, Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

Filed Oct. 2, 1969, Ser. No. 863,166
Int. Cl. C07c *51/44*
U.S. Cl. 260—541 2 Claims



Formic acid is removed from a crude liquid comprising predominantly acetic acid and formic acid by passing the liquid downwardly through a stripping column within which the liquid, at an elevated temperature, is contacted countercurrently with an upwardly-flowing vapor comprising a lower alkanol or a lower alkyl acetate which has a boiling point lower than that of acetic acid. Within the column the formic acid reacts with the alkanol or alkyl acetate to form the corresponding alkyl formate which is removed as vapor from the head of the column. From the base of the column there is withdrawn a purified acetic acid having a formic acid content lower than that of the crude mixture fed into the head of the column.

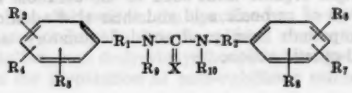
3,660,484

ARYL UREAS, A PROCESS FOR THEIR PREPARATION AND AGENTS CONTAINING THEM

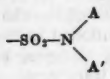
Henry Martin and Dieter Duerr, Basel, and Rudolf Hitz, Muttenz, Switzerland, assignors to Ciba Limited, Basel, Switzerland

No Drawing. Continuation of application Ser. No. 513,551, Dec. 13, 1965. This application Oct. 2, 1969, Ser. No. 863,769
Claims priority, application Switzerland, Dec. 17, 1964, 16,314/64
Int. Cl. C07c *157/00*
U.S. Cl. 260—552 R 3 Claims

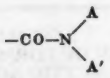
Ureas of the formula



wherein R_1 and R_2 each represents a linear or branched alkylene radical which may be hydroxylated and which contains 1 to 4 carbon atoms, and either R_1 or R_2 may be a direct N—phenyl bond; R_3 to R_8 are identical or different and represent hydrogen or halogen atoms, or alkyl, alkoxy or alkylthio groups, or the groups —CF_3, —CN, NO_2, SCN,



or



(where A and A' represent hydrogen atoms or lower alkyl groups) with the proviso that at least one of the substituents R_3 to R_8 is a trifluoromethyl group, and wherein R_9 and R_{10} represent hydrogen atoms or lower alkyl groups and X stands for an oxygen atom or a sulphur atom. These ureas are capable of killing off a variety of harmful organisms; for example, they have an insecticidal, acaricidal, bactericidal, fungicidal, molluscicidal and herbicidal effect.

3,660,485

FLUORENE-9-CARBOXYLIC ACID HYDRAZIDES

John W. Cusic, Skokie, and Chung Hwai Yen, Chicago, Ill., assignors to G. D. Searle & Co., Chicago, Ill.

No Drawing. Filed Oct. 5, 1970, Ser. No. 78,278
Int. Cl. C07c *103/19*
U.S. Cl. 260—558 H **4 Claims**

Hydrazides of 9-aminoalkyl fluorene-9-carboxylic acid are described herein. Generally, these compounds are obtained by the reaction of the appropriate ester with hydrazine. The compounds are useful against bacteria, helminths, fungi, and algae. In addition, they are anti-arrhythmic agents.

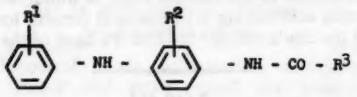
3,660,486

DIPHENYL AMINE UREA DERIVATIVES

Kurt Thiele, Frankfurt am Main, Germany, assignor to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

No Drawing. Continuation-in-part of application Ser. No. 656,073, July 26, 1967. This application Dec. 15, 1969, Ser. No. 885,311
Int. Cl. C07c *127/00*
U.S. Cl. 260—533 A **6 Claims**

Diphenyl amine derivatives of the formula



wherein each of R^1 and R^2 can be hydrogen, halogen, hydroxy, lower alkyl or lower alkoxy and R^3 is lower alkyl or alkenyl of up to 6 carbon atoms; pyridyl; phenyl or pyridyl substituted with halogen, hydroxy, amino, lower alkoxy or lower alkyl; lower alkoxy with 1 to 6 carbon atoms; mono and dialkyl amino groups wherein alkyl is of 1 to 6 carbon atoms in which the alkyl groups can be closed, if desired, with another heteroatom to a 5, 6 or 7 membered ring as in pyrrolidone, piperidine morpholine, piperazine and homopiperazine and any primary amino groups present can, if desired, be acylated with low molecular weight organic acids such as the alkanoic acids or derivatives of carbonic acid and their acid addition salts. The compounds have good anti-inflammatory, analgesic and anti-pyretic action.

3,660,487

N-(ALKYL) ALKANESULFONAMIDOPHENETHANOLAMINES

Aubrey A. Larsen and Robert H. Uloth, Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

No Drawing. Filed Oct. 2, 1969, Ser. No. 863,388
Int. Cl. C07c *143/74*
U.S. Cl. 260—556 A **27 Claims**

A new class of sympatholytic phenethanolamines with N-(alkyl)alkanesulfonamido and hydroxy aromatic substituents has been synthesized. The substances are pharmacologically active adrenergic blocking agents. A preferred compound is 2'-hydroxy-5'-[1-hydroxy-2-(1-phenoxy - 2 - propylamino)propyl]-N-methylmethanesulfonanilide which effectively suppresses both alpha and beta adrenergic stimulation.

3,660,488

2-HALO-ALKYLENE- AND -CYCLOPENTYLENE-2-AMINO-PROPANE 1,3-DIOLS

Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed July 16, 1965, Ser. No. 472,733
Int. Cl. C07c *87/02, 91/16, 95/02*
U.S. Cl. 260—584 **9 Claims**

2-amino-2-halohydrocarbyl-1,3-propanediols are prepared by reacting tris(hydroxyhydrocarbyl)methylamine with an aldehyde to form a bicyclo reaction product, halogenating said reaction product and hydrolyzing the product of the halogenation reaction to form the corresponding amino- and halo-substituted alkanediols. The substituted alkanediols of the invention are useful as starting compounds for the preparation of 2-amino-2-mercaptoalkyl-1,3-propanediols which are compounds having known antiradiation activity.

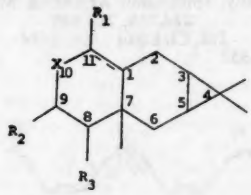
3,660,489

NOVEL CARANONE DERIVATIVES, PERFUME COMPOSITIONS CONTAINING SAME AND PROCESS FOR THEIR PREPARATION

Dietmar Lamparsky, Wangen-Dubendorf, and Peter Schudel, Grut, near Wetzikon, Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

No Drawing. Filed Oct. 2, 1968, Ser. No. 764,636
Claims priority, application Switzerland, Oct. 11, 1967, 14,296/67
Int. Cl. C07c *49/36, 49/54*
U.S. Cl. 260—586 R **13 Claims**

The disclosure is concerned with odorant compositions which are characterized in that they contain novel, olfactorily-desirable compounds of the general formula:



wherein R_1, R_2 and R_3 represent hydrogen atoms or lower alkyl groups, X signifies a CO, CHOH, CHOAc, CH_2 or =CH group (double bond directed towards C_9), Ac denoting the acyl residue of a lower alkanecarboxylic acid, and

signifies a C—C single or double bond.

The invention is also concerned with the novel compounds of general Formula I as well as processes for the manufacture thereof.

3,660,490

TRANS-OCTAHYDRO - 4a - LOWER ALKYL-5-(t-BUTOXY OR BENZYLOXY) - 2 - OXO-1-(4-SUBSTITUTED - 3 - OXOBUTYL)-1-NAPHTHALDEHYDES

Marinus Los, Trenton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Original application June 4, 1964, Ser. No. 372,690, now Patent No. 3,446,849. Divided and this application Jan. 6, 1969, Ser. No. 789,366

Int. Cl. C07c *49/54, 45/00, 47/44*

U.S. Cl. 260—586 R 2 Claims

This disclosure describes compounds of the class of trans-1,2,4a,5,6,7,8,8a-octahydro-4a-lower alkyl-5-(t - butoxy or benzyloxy)-2-oxo-1-(4-substituted-3-oxobutyl)-1-naphthaldehydes useful as intermediates in the synthesis of biologically active steroid moieties.

3,660,491

METHOD FOR PREPARING UNSYMMETRICAL KETONES BY COBALT CATALYZED DECARBOXYLATION OF ACIDS

Hubert H. Thigpen and John C. Trebellas, Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

No Drawing. Filed May 15, 1969, Ser. No. 825,080

Int. Cl. C07c *49/76, 49/80*

U.S. Cl. 260—592 7 Claims

Preparation of an alkyl aryl ketone by reacting an aromatic acid with an aliphatic acid in the presence of a cobalt ion catalyst.

3,660,492

SYNTHESIS OF DIISOPROPYL KETONE

Harold W. Tompkins, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed July 22, 1969, Ser. No. 843,784

Int. Cl. C07c *49/06, 47/04*

U.S. Cl. 260—593 5 Claims

Diisopropyl ketone is produced by passing 2,2,4-trimethyl-1,3-pentanediol over activated alumina catalyst at a temperature in the approximate range 650–975° F. and at approximately 1–6 volumes of feed to volume of catalyst per hour. A product purity of 98 weight percent or better is obtained.

3,660,493

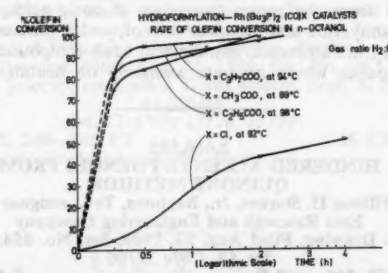
HYDROFORMYLATION PROCESS

Peter Johnson, Chertsey, and Malcolm John Lawrenson, Eastcote, Ruislip, England, assignors to The British Petroleum Company Limited, London, England

Filed Oct. 17, 1967, Ser. No. 675,842

Int. Cl. C07c *45/10*

U.S. Cl. 260—604 HF 14 Claims


% OLEFIN CONVERSION
HYDROFORMYLATION— Rh(Bu$_3^n$P)$_2$ (CO)X CATALYSTS
RATE OF OLEFIN CONVERSION IN n-OCTANOL
Gas ratio H$_2$:CO=2:1
X = C$_2$H$_7$COO, at 94°C
X = CH$_3$COO, at 89°C
X = C$_2$H$_5$COO, at 98°C
X = Cl, at 92°C
(Logarithmic Scale)
TIME (h)

Alcohols and/or aldehydes are formed by reacting olefins with carbon monoxide and hydrogen in the presence of a monovalent rhodium complex having a carboxylate ligand. Trialkyl phosphines are preferred complexing ligands. Alcoholic solvents aid the reaction which may be carried out at atmospheric pressure.

3,660,494

CARBORANE PREPARATION FROM BORANES

Jerome F. Ditter, Covina, Eugene B. Klusmann, West Covina, and Robert E. Williams, La Canada, Calif., assignors to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Sept. 23, 1970, Ser. No. 74,851

Int. Cl. C07f *5/02*

U.S. Cl. 260—606.5 B 5 Claims

An efficient method of synthesizing higher weight closo-carboranes by heating smaller molecular weight carboranes (5 borons or less per atom) with one of the smaller molecular weight boranes.

3,660,495

PROCESS FOR PREPARING HYDROXYMETHYLATED PHOSPHINES

Kingso Chingtsung Lin, Newark, Ohio, assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Filed Dec. 10, 1969, Ser. No. 883,990

Int. Cl. C07f *9/02*

U.S. Cl. 260—606.5 P 7 Claims

Primary and secondary phosphines as well as phosphine itself react with formaldehyde to produce hydroxymethylated tertiary phosphines at a temperature between about 20–130° C. at about atmospheric to slightly elevated pressures. The reaction procedes smoothly to afford a product of excellent purity in nearly quantitative yields.

3,660,496

PREPARATION OF SULFIDES AND SULFOXIDES

Louis Schmerling, Riverside, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Oct. 16, 1969, Ser. No. 867,086

Int. Cl. C07c *149/16, 147/14*

U.S. Cl. 260—607 A 11 Claims

Organic sulfur-containing compounds and particularly organic sulfoxides or sulfides are prepared by condensing thionyl chloride with an olefinic hydrocarbon in the presence of a free radical generating catalyst to prepare organic sulfoxides or sulfides depending upon the temperature which is utilized during the reaction.

3,660,497

DODECYLETHER METHYL SULFIDES

Hill M. Priestley, North Bergen, and James H. Wilson, Demarest, N.J., assignors to Lever Brothers Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 869,985, Aug. 25, 1969, which is a continuation-in-part of application Ser. No. 647,333, June 20, 1967, which is a continuation-in-part of application Ser. No. 365,487, May 6, 1964, which in turn is a continuation-in-part of applications Ser. No. 725,505, Apr. 1, 1958, and Ser. No. 60,546, Oct. 5, 1960. This application Mar. 13, 1970, Ser. No. 19,484

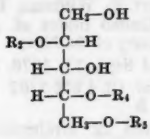
Int. Cl. C07c *149/10*

U.S. Cl. 260—609 A 3 Claims

There are disclosed in the specification novel sulfides which are dodecyl acetonyl sulfide, dodecyloxyethyl methyl sulfide, and dodecyloxyethoxyethyl methyl sulfide, useful in the preparation of suds-stabilizing sulfoxides.

3,660,498
PENTOL DERIVATIVES
Alberto Rossi, Oberwil, Switzerland, assignor to Ciba Corporation, Summit, N.J.
No Drawing. Filed June 27, 1969, Ser. No. 837,316
Claims priority, application Switzerland, July 5, 1968, 10,065/68
Int. Cl. C07c *43/20*
U.S. Cl. 260—611 A 10 Claims

D-arabitol compounds of formula



(I)

wherein each of the residues R_2, R_4 and R_5 denotes an optionally substituted hydrocarbon residue, as well as O-acyl derivatives thereof show antiinflammatory effects.

3,660,499
ARYL 3-IODOPROPARGYL FORMALS
Kanjiro Kobayashi, Nishinomiya, Takashi Uyama, Kobe, Hideo Suzuki, Amagasaki, and Hiroshi Shirai, Suita, Japan, assignors to Nagase & Co., Ltd., Osaka, Japan
No Drawing. Filed Mar. 3, 1970, Ser. No. 16,255
Claims priority, application Japan, Mar. 3, 1969, 44/16,355; May 7, 1969, 44/35,455
Int. Cl. C07c *43/30*
U.S. Cl. 260—613 D 8 Claims

Iodized formal compounds of the formula

$$ArOCH_2OCH_2C{\equiv}CI$$

wherein Ar is a phenyl, naphthyl or nitrogen-containing aromatic group substituted or not with alkyl, halogen or nitro group(s) are bactericidal and fungicidal agents.

3,660,500
PREPARATION OF 2,2'-DINITROBENZHYDROLS
Goetz E. Hardtmann, Florham Park, and Bruno S. Huegi, Caldwell, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.
No Drawing. Filed Dec. 31, 1969, Ser. No. 889,673
Int. Cl. C07c *29/00*
U.S. Cl. 260—613 R 7 Claims

Disclosed is preparation of 2,2'-dinitrobenzhydrols involving a two single phase low temperature process in which a 2-bromonitrobenzene is reacted with phenyllithium to obtain a 1-lithio-2-nitrobenzene which is then reacted with an o-nitrobenzaldehyde to obtain the 2,2'-dinitrobenzhydrol.

3,660,501
METAL-ORGANIC COMPOUNDS
Aina Lisbeth Abramo, Rolf Bjorklund, Bernt Borretzen, Knut Gunnar Olsson, and Bertil Sundbeck, Malmo, Sweden, assignors to AB Ferrosan, Malmo, Sweden
No Drawing. Filed Dec. 22, 1969, Ser. No. 887,336
Claims priority, application Great Britain, Dec. 24, 1968, 61,474/68
Int. Cl. C07c *43/22*
U.S. Cl. 260—613 D 7 Claims

The present invention relates to new metal-organic compounds derived from halogenated phenols. The main idea of the invention is that the phenol group of the metal-organic compounds of the invention is protected by an acetal group and that the halogen has been reacted to form a conventional metal-organic compound. The metal-organic compounds of the invention are especially adapted to be used in syntheses to introduce a phenol group into a molecule. The main advantage is that the protecting group in the form of an acetal group very easily can be removed in a subsequent conversion to form the free phenol or the phenol esters.

3,660,502
HALOGEN-CONTAINING POLYOLS AND POLYURETHANES PREPARED THEREFROM
Leslie Catron Case, 14 Lockeland Road, Winchester, Mass. 01890
No Drawing. Filed May 13, 1968, Ser. No. 728,824
Int. Cl. C07c *43/30*
U.S. Cl. 260—615 A 10 Claims

Novel polyols having a substantial halogen content and having good thermal stability are prepared by the reaction of hemiacetals or hemiketals of lower aliphatic halogenated aldehydes or ketones, and monoepoxides. These halogen-containing polyols are further reacted to prepare flame-resistant polyurethane compositions.

3,660,503
PREPARATION OF PRIMARY ALCOHOLS
Herman S. Bloch, Skokie, and George R. Lester, Park Ridge, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Continuation-in-part of application Ser. No. 833,787, June 16, 1969, which is a continuation-in-part of application Ser. No. 579,499, Sept. 15, 1966. This application Aug. 18, 1970, Ser. No. 64,812
Int. Cl. C07c *31/02, 37/00*
U.S. Cl. 260—617 H 11 Claims

Hydrocarbonaceous compounds such as n-paraffins, branched-chain paraffins, and certain cycloparaffins can be converted to primary alcohols by treatment with hydrogen peroxide as the sole hydroxylating agent in the presence of a catalyst containing a Group VIII metal such as nickel composited on kieselguhr. In this way n-pentane can be converted to 1-pentanol.

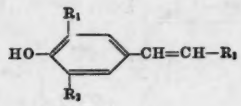
3,660,504
PROCESS FOR MANUFACTURE OF ALCOHOLS
Kenzo Oda, Osaka, Yukio Okuda, Toyonaka-shi, Naoji Kurata, Nishinomiya-shi, Kazuo Koshida, Ashiya-shi, and Masatoshi Tsuchino, Osaka, Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan
No Drawing. Continuation-in-part of application Ser. No. 595,606, Nov. 21, 1966. This application Nov. 19, 1969, Ser. No. 878,242
Claims priority, application Japan, Apr. 22, 1965, 40/71,489
Int. Cl. C07c *29/00*
U.S. Cl. 260—617 H 4 Claims

Process for the manufacture from saturated aliphatic or alicyclic hydrocarbons of corresponding alcohols by the liquid phase oxidation method with the use of molecular oxygen-containing gas, characterized in that the oxidation is carried out in the presence of a catalyst selected from the group consisting of boric acids, boric acid anhydride and mixtures thereof, and a promoter selected from ammonia, ammoniacal basic compounds, and compounds which generate ammonia on heating.

3,660,505
HINDERED ALKENYL PHENOLS FROM QUINONE METHIDE
William H. Starnes, Jr., Baytown, Tex., assignor to Esso Research and Engineering Company
No Drawing. Filed Aug. 27, 1969, Ser. No. 854,359
Int. Cl. C07c *37/06*
U.S. Cl. 260—619 R 7 Claims

The hindered alkenyl phenols having the following structure are useful as antioxidants for hydrocarbons and

especially for polyolefins such as polypropylene and are produced by the reaction of a quinone methide with an alkyl or aralkyl Grignard reagent, oxidizing the newly formed 4-alkyl- or aralkylphenol with basic ferricyanide to produce a new quinone methide, and then reacting the quinone methide with a tertiary amine or a trialkylphosphine to produce the following structure:



where

R_1 and R_2 are alkyls having 1 to 8 carbon atoms, preferably a tertiary alkyl; and

R_3 is selected from the group consisting of alkyl and aryl.

3,660,506
CONVERSION OF OLEFINS
Robert L. Banks and Joseph R. Kenton, Bartlesville, Okla., assignors to Phillips Petroleum Company
No Drawing. Continuation of application Ser. No. 678,499, Oct. 27, 1967, which is a continuation-in-part of application Ser. No. 627,668, Apr. 3, 1967. This application Jan. 26, 1970, Ser. No. 6,045
Int. Cl. C07c *3/20*
U.S. Cl. 260—666 **11 Claims**

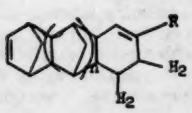
Olefins are converted by contact with a combined catalyst comprising an olefin reaction catalyst and a double bond isomerization catalyst.

3,660,507
CONVERSION OF OLEFINS
Robert E. Reusser, Bartlesville, Okla., assignor to Phillips Petroleum Company
No Drawing. Continuation of application Ser. No. 627,669, Apr. 3, 1967. This application Jan. 12, 1970, Ser. No. 1,969
Int. Cl. C07c *3/10*
U.S. Cl. 260—666 A **11 Claims**

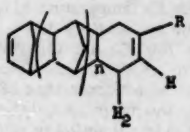
Olefins are converted into other olefins having different molecular weights by contact with a catalyst active for disproportionating propylene into ethylene and butene and with magnesium oxide which has been treated with carbon monoxide, nitric oxide, hydrogen or an olefinic or a paraffinic hydrocarbon at elevated temperature.

3,660,508
POLYCYCLIC COMPOUNDS AND COPOLYMERS DERIVED THEREFROM
Edward Charles Dart, Richard Gregory Foster, and Paul Hepworth, Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England
No Drawing. Filed Aug. 21, 1970, Ser. No. 66,139
Claims priority, application Great Britain, Sept. 3, 1969, 43,585/69
Int. Cl. C07c *13/28, 13/54*
U.S. Cl. 260—666 PY **18 Claims**

A polycyclic diene having the structure



mixtures thereof with a polycyclic diene having the structure

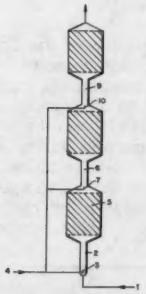


where R is a hydrocarbyl group and *n* is zero or an integer, derivatives of said dienes in which one or more of the cyclic carbon atoms other than those forming part of a carbon-carbon double bond in an endomethylene bridged ring and those indicated as carrying hydrogen atoms carries a further hydrocarbyl substituent group, a process for their preparation and vulcanisable olefin copolymers derived therefrom.

3,660,509
PREPARATION OF CYCLIC ALKENES
Robert P. Arganbright, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.
No Drawing. Filed Aug. 11, 1969, Ser. No. 849,934
Int. Cl. C07c *13/16*
U.S. Cl. 260—666 A **10 Claims**

A cyclic alkene can be prepared by the intramolecular reaction of an unconjugated diolefin over a supported Group VI–B or VII–B metal oxide; for example, 1,7-octadiene reacts with itself when passed over MoO_3 on alumina to give cyclohexene and ethylene at 96 percent conversion and 90 percent selectivity (based on 1,7-octadiene feed and cyclohexene product respectively).

3,660,510
CATALYTICALLY DEHYDROGENATING ALKYLATED AROMATIC HYDROCARBONS
Hubert Kindler and Winfried Single, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany
Filed Mar. 30, 1970, Ser. No. 24,035
Claims priority, application Germany, Apr. 3, 1969, P 19 17 279.3
Int. Cl. C07c *15/10*
U.S. Cl. 260—669 **18 Claims**



Method of catalytically dehydrogenating an alkylated aromatic hydrocarbon having at least two carbon atoms in a side-chain to a vinylaromatic hydrocarbon by rapidly passing through a catalyst zone a feedstock which has been heated to the reaction temperature and has been obtained by mixing a preheated mixture containing the alkylated aromatic hydrocarbon and optionally steam and optionally the vinylaromatic hydrocarbon with steam heated to a temperature above the temperature of reac-

tion. The preheated mixture has a temperature of from 400° to 620° C. and the steam heated to above the reaction temperature has a temperature of from 820° to 1,100° C. and the resulting feedstock has a blend temperature of from 550° to 700° C., the time taken for mixing the preheated mixture with the heated steam being less than 0.1 second while the residence time of the resulting feedstock between the mixing point and the point of entry into the catalyst zone is less than 0.2 second. The products are important monomers and comonomers.

3,660,511

FLUORODIAZADIENES AND PROCESS OF MAKING

Paul H. Ogden, Oakdale Township, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Continuation-in-part of application Ser. No. 577,192, Sept. 6, 1966. This application Apr. 3, 1967, Ser. No. 627,607

Int. Cl. C07c *119/00*

U.S. Cl. 260—566 R **14 Claims**

Trifluoromethylimino terminated compounds useful as dehydrating agents, crosslinking agents and ultraviolet light filters and process for making by isomerizing perfluoro-α,ω-bisazomethines in the presence of ionic fluoride.

3,660,512

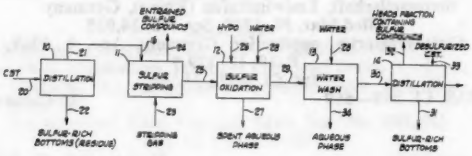
PROCESS FOR REMOVING SULFUR FROM CRUDE SULFATE TURPENTINE OR DISTILLATE FRACTION THEREOF

Clayton B. Hamby, Charles W. Barrett, and John M. Derfer, Jacksonville, Fla., assignors to SCM Corporation, Cleveland, Ohio

Filed Apr. 13, 1970, Ser. No. 27,578

Int. Cl. C07c *13/00, 27/02*

U.S. Cl. 260—675.5 **9 Claims**



Crude sulfate turpentine or distillate fraction thereof is desulfurized while simultaneously retarding chlorination of the organic components therein. The stock for treatment is mixed with an aqueous dispersion of hypochlorite containing not substantially more than about 10% available chlorine and having a pH from 10.1 to 10.6 until maximum desulfurization has occurred consistent with acceptable limited increase in organic chloride. The resulting desulfurized raffinate phase is separated from the aqueous phase, washed with water, and recovered.

3,660,513

ISOPRENE FROM MIXTURE OF C_5-PARAFFINS AND OLEFINS BY ONE-STEP OXIDATIVE DEHYDROGENATION WITH ISOMERIZATION OF RECYCLE n-AMYLENES

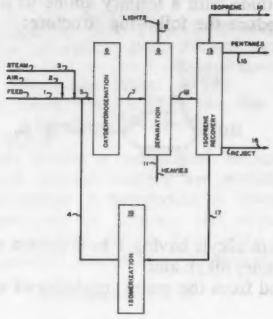
Joseph W. Davison, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Jan. 8, 1970, Ser. No. 1,433

Int. Cl. C07c *5/18*

U.S. Cl. 260—680 E **12 Claims**

Isoprene is prepared from a stream composed of mixed C_5 aliphatics, including both normal and branched, saturated and unsaturated, components, by selectively oxidatively dehydrogenating only the isoolefins within the mixed C_5 stream. The isoprene produced is recovered, while



the remainder of the stream is separated into pentanes and n-amylenes, the latter being skeletally isomerized and recycled to selective dehydrogenation.

3,660,514

OXIDATIVE DEHYDROGENATION PROCESS AND CATALYST

Robert S. Cichowski, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Aug. 6, 1970, Ser. No. 61,830

Int. Cl. C07c *5/18*

U.S. Cl. 260—680 E **7 Claims**

Alkenes, alkylpyridines and alkylaromatics are dehydrogenated by contact with oxygen in the temperature range of 750 to 950° F. in the presence of a catalyst comprising iron phosphate promoted by rhenium.

3,660,515

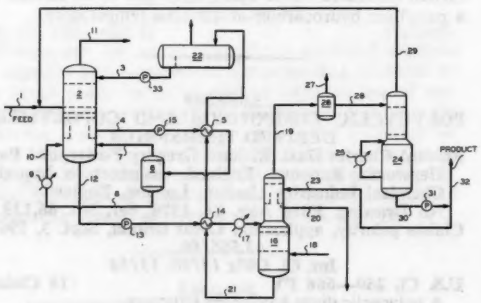
HYDROCARBON PURIFICATION

Ronald S. Rogers, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed July 28, 1969, Ser. No. 845,287

Int. Cl. C07c *7/00, 11/16*; C10g *21/00*

U.S. Cl. 260—681.5 R **10 Claims**



A method of separating a butene-containing stream of impurities such as oxygen, nitrogen and oxides of carbon by employing an absorption oil in which a portion of the absorption oil is recycled through a flash drum and reintroduced into the absorber, a portion of the impurities

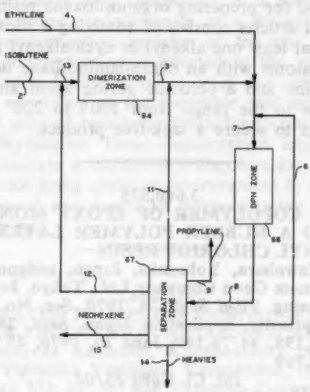
being recycled back to the absorber from the final stripper to minimize butane losses.

3,660,516

NEOHEXENE FROM ISOBUTENE AND ETHYLENE

Donald L. Crain and Robert E. Reusser, Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed Apr. 15, 1970, Ser. No. 28,661
Int. Cl. C07c 3/62
U.S. Cl. 260—683 D 6 Claims



Neohexene is prepared from isobutene and ethylene by dimerizing the isobutene to diisobutylene and subjecting the diisobutylene to ethylene cleavage by way of an olefin disproportionation reaction.

3,660,517

CONVERSION OF OLEFINS

Robert E. Reusser and Donald L. Crain, Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed Nov. 6, 1969, Ser. No. 874,147
Int. Cl. C07c 3/62
U.S. Cl. 260—683 D 1 Claim

2,3-dimethylbutene is produced by contacting isobutylene with catalyst comprising a mixture of tungsten oxide on silica and magnesium oxide. Ethylene can be added to permit the production of neohexene.

3,660,518

PROCESS UTILIZING π BASE AROMATIC MODIFIED CATALYST FOR WAX PRODUCTION

Neville L. Cull, Baker, and Roby Bearden, Jr., and Joseph K. Mertzweiller, Baton Rouge, La., assignors to Esso Research and Engineering Company

No Drawing. Filed Dec. 5, 1968, Ser. No. 781,614
Int. Cl. C07c 3/10
U.S. Cl. 260—683.15 D 12 Claims

An ethylene growth process for obtaining reaction product mixtures rich in linear C_{22} to C_{200} wax range olefins, especially linear alpha olefins of the C_{40} to C_{100} carbon number range. An ethylene oligomerization reaction is conducted in a diluent in the presence of an oligmerization catalytic mixture consisting of a transition metal halide and an organoaluminum halide, previously modified by treatment with a pi base compound, particularly a pi base aromatic compound, to yield said wax range without substantial production of high molecular weight polymers. Pressures and temperatures are selected to maintain a molar ratio of ethylene to product olefins sufficient to minimize copolymerizable of the product olefins.

3,660,519

PROCESS FOR PRODUCING HIGHER OLEFINS

Takaaki Arakawa, Iwakuni, and Yoshikuni Sato, Yamaguchi-ken, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

No Drawing. Filed Aug. 14, 1970, Ser. No. 63,904
Claims priority, application Japan, Aug. 20, 1969, 44/65,314
Int. Cl. C07c 3/10
U.S. Cl. 260—683.15 D 10 Claims

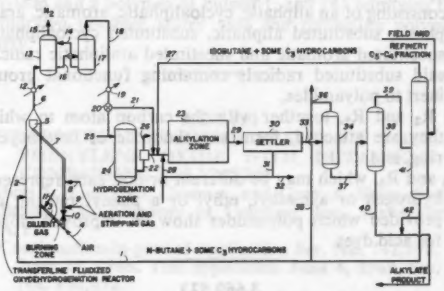
C_8–C_{20} olefins having high linearity are obtained at high selectivity by oligomerizing ethylene at a temperature of −30° C. to +50° C. in a solvent in the presence of a catalyst, the catalyst being prepared by (a) reacting at least one titanium compound such as titanium tetrachloride with at least one organic electron donor such as acetone, acrylonitrile or triethyl phosphine, (b) adding to the reaction product an aluminum alkyl halide containing more than 1.5 and not more than 2.9 bonded halogen atoms per atom of aluminium, such as ethyl aluminium dichloride, and (c) adding at least one organosulfur compound such as ethyl mercaptan or diphenyl disulfide to the resulting mixture. These olefins are useful as the materials of plasticizers and detergents.

3,660,520

INTEGRATED OXYDEHYDROGENATION AND ALKYLATION PROCESS

Charles E. Hemminger, Peapack, N.J., assignor to Esso Research and Engineering Company

Filed Feb. 18, 1970, Ser. No. 12,224
Int. Cl. C07c 3/52, 3/54
U.S. Cl. 260—683.43 7 Claims



A saturated C_3–C_4 hydrocarbon feed is dehydrogenated with an oxygen-containing gas and a fluidized catalyst, such as, bismuth phosphate on activated alumina, vanadium oxide or bismuth oxide, to form C_3 and C_4 monoolefins. The olefin fraction is then alkaylated with isoparaffin and a catalyst, such as H_2SO_4, HF or zeolites. The olefin fraction may be hydrogenated prior to alkylation to convert any butadiene formed in the dehydrogenation reaction to butene.

3,660,521

POLYMERIC COMPOUNDS

John Robert Dann, William Frank Fowler, Jr., and Susan Cook Gross, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Nov. 28, 1969, Ser. No. 880,896
Int. Cl. C08g 17/08
U.S. Cl. 260—75 S 15 Claims

This invention relates to polymers containing units of thio-substituted polycyclic compounds and to processes of making said polymers. In one aspect, polymers of this

invention provide very useful materials for making synthetic plastic lenses having desirable optical properties. In another aspect, these compounds are useful in photographic emulsions.

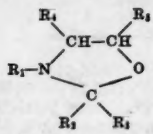
3,660,522

MODIFIED HIGH MOLECULAR WEIGHT POLYAMIDES WITH HIGH AFFINITY FOR ACID DYES

Joachim Schneider, Krefeld-Uerdingen, Karl-Heinz Hermann and Hans Rudolph, Krefeld-Bockum, and Gunter Nawrath, Dormagen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Jan. 28, 1970, Ser. No. 6,582
Claims priority, application Germany, Feb. 1, 1969, P 19 05 099.8
Int. Cl. C08g *20/38*
U.S. Cl. 260—78 L 1 Claim

Modified high-molecular weight polyamides having chemically incorporated therein 0.01 to 10% by weight of an oxazolidine of the general formula



wherein

R_1 represents a C_1 to C_{20} aliphatic radical selected from the group consisting of an unsubstituted radical and a substituted radical containing functional groups inert to polyamides, a cycloaliphatic or a benzyl radical,

R_2 and R_3, which may be different or not, each represents hydrogen or a C_1 to C_{20} radical selected from the group consisting of an aliphatic, cycloaliphatic, aromatic, araliphatic, substituted aliphatic, substituted cycloaliphatic, substituted aromatic and substituted araliphatic radical, said substituted radicals containing functional groups inert to polyamides,

or R_2 and R_3, together with the carbon atom to which they are attached, form a carbocyclic or heterocyclic ring, and

R_4 and R_5, which may be different or not, each represents hydrogen or a methyl, ethyl or a phenyl radical; are provided which polyamides show an improved affinity for acid dyes.

3,660,523

ALUMINUM PRIMER CONTAINING EPOXIDE RESIN AND ISOCYANATE TERMINATED URETHANE PREPOLYMER

John R. Grawe, Metairie, La., and Raymond J. Bissig, Des Plaines, Ill., assignors to Desoto, Inc., Des Plaines, Ill.

No Drawing. Filed Feb. 25, 1970, Ser. No. 14,197
Int. Cl. C08g *45/12*
U.S. Cl. 260—830 P 17 Claims

Organic solution primers intended for application to a clean aluminum surface which enable the primed surface to be more securely bonded are provided by reacting a resinous polyepoxide with an isocyanate-terminated polyurethane. The polyurethane is a reaction product of excess organic diisocyanate and diol having a molecular weight up to amout 200, the molar ratio of diisocyanate to diol being in the range of 1.2:1 to 1.75:1 so that from 60 to 90% of the isocyanate functionality of the diisocyanate is consumed by reaction to produce the isocyanate-terminated polyurethane. The polyepoxide used has an epoxy equivalency of at least 1.4, and an hydroxy equivalency in the range of .75 to 1.9, and is reacted with the polyurethane with the hydroxy functionality of the polyepoxide being in the range of 2:1 to 4:1 with respect to the isocyanate functionality of the polyurethane.

3,660,524

MOLD ARTICLES AND COATING BASED ON ORGANOPOLYSILOXANES

Ignaz Bauer, Rudolf Riedle, and Siegfried Nitzsche, Burghausen, Upper Bavaria, Germany, assignors to Wacker-Chemie G.m.b.H., Munich, Germany

No Drawing. Original application Feb. 7, 1968, Ser. No. 703,549, now Patent No. 3,578,490, dated May 11, 1971. Divided and this application Aug. 5, 1970, Ser. No. 61,513
Claims priority, application Germany, Nov. 15, 1967, W 45,165
Int. Cl. C08g *47/04, 47/10, 31/30*
U.S. Cl. 260—825 4 Claims

A method for preparing organosiloxane resin coatings and molded articles consists of admixing a siloxane resin containing at least one alkenyl or cycloalkenyl group per 10 silicon atoms with an organoaminosilane or organoaminosilazane and a peroxide curing agent and heating the mixture to the range from 100° to 220° C. for 1 to 24 hours to secure a tack-free product.

3,660,525

GRAFT COPOLYMER OF EPOXY MONOMER ONTO A RUBBER POLYMER LATEX AND A VINYL CHLORIDE RESIN

Testuyo Kawahara, Yokosuka, Japan, assignor to The Japanese Geon Company Ltd., Tokyo, Japan

No Drawing. Filed Sept. 24, 1970, Ser. No. 75,297
Claims priority, application Japan, Sept. 26, 1969, 44/76,198, 44/76,199; June 20, 1970, 45/62,768, 45/62,769
Int. Cl. C08g *45/04*
U.S. Cl. 260—836 17 Claims

A graft copolymer obtained by polymerizing 50–150 parts by weight of monomeric mixture consisting of 95–15 weight of an aromatic vinyl compound, 0–35 weight percent of a vinyl cyanide compound and 0–80 weight percent of a methacrylic ester, along with 0.01–10 parts by weight of an unsaturated olefinic compound having a three-membered epoxy group, in the presence of 100 parts by weight of a diene type rubbery polymer latex (as the rubber portion).

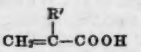
3,660,526

ADHESIVE COMPOSITION CONTAINING A VINYL ESTER RESIN AND AN ACRYLIC ESTER OF TETRAHYDROFURFURYL ALCOHOL OR DIHYDRODICYCLOPENTADIENOL

Bernd Wegemund, Hilden-Rhineland, and Gunter Tauber, Dusseldorf-Holthausen, Germany, assignors to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany

No Drawing. Filed Mar. 30, 1970, Ser. No. 23,957
Claims priority, application Germany, Apr. 24, 1969, P 19 20 830.1
Int. Cl. C08g *45/04*
U.S. Cl. 260—837 R 3 Claims

Adhesive compositions hardenable under exclusion of oxygen comprising liquid esters of methacrylic and acrylic acids which harden under exclusion of oxygen, an organic percompound selected from the group consisting of organic hydroperoxides having from 3 to 18 carbon atoms and organic peroxides whose half life decomposition temperature after 10 hours is greater than 85° C., and at least 10% by weight of an epoxide-group-free reaction product from a glycidyl ether of a polyhydric phenol and an acid of the formula



wherein R′ is a member selected from the group consisting of hydrogen, lower alkyl and halogen, said reaction product having a molecular weight of between about 300 and 2500. Said compositions form a high tensile shear strength adhesive bond.

3,660,527

METHOD OF THE SOLUTION POLYMERIZATION OF ACRYLONITRILE

Hiroshi Sakai, Zenzi Izumi, and Hideji Kitagawa, Iyo-gun, Satosi Hamada, Matsuyama, and Masakuni Hoshina, Iyo-gun, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

No Drawing. Filed June 15, 1970, Ser. No. 46,542
Int. Cl. C08f *3/76, 15/22*
U.S. Cl. 260—85.5 9 Claims

A method wherein, in carrying out the solution polymerization of either acrylonitrile singly or a mixture consisting of at least 70 mol percent thereof and at least one polymerizable vinyl compound, in a polymerization solvent consisting predominantly of a dialkyl sulfoxide, using a polymerization initiator of the azo compound type, the polymerization is effected in the presence, as a discoloration inhibitor, of at least one compound of the group consisting of the inorganic acid salts and organic acid salts of beta-hydroxyethylhydrazine and beta-cyanoethylhydrazine. These discoloration inhibitors not only demonstrate a satisfactory discoloration preventive effect but also bring about an improvement in the polymerization speed and degree of polymerization of the resulting polymer.

3,660,528

UNSATURATED POLYESTER RESINS, METHOD OF THEIR PRODUCTION AND APPLICATION

Alla Elisbarovna Kostenko, Komsomolsky prospekt 8, kv. 56; Valentina Vasilievna Karpukhina, Ulitsa Lishchanskaya 31b, kv. 51; and Valentina Petrovna Tovpyaga, Ulitsa Donetskaya 44a, kv. 33, all of Severodonetsk Luganskoi Oblasti, U.S.S.R.; Gila Naumovich Freidlin, Prospekt Lenina 135, kv. 59; and Ary Artemovich Adamov, Prospekt Leinina 135, kv. 71, both of Tula, U.S.S.R.; and Lidia Fedotovna Berezhnaya, Ulitsa Kalinina 15, kv. 10, Severodonetsk Luganskoi Oblasti, U.S.S.R.

No Drawing. Filed Feb. 12, 1970, Ser. No. 11,005
Int. Cl. C08f *21/00, 43/00*
U.S. Cl. 260—861 10 Claims

A method of producing unsaturated polyester resins that contain terminal vinyl groups in the polymer chain, that set without additional introduction of a cross-linking monomer, with the formation of polymers featuring high thermostability and mechanical strength; the method residing in condensing polyhydric alcohols with unsaturated acids or anhydrides thereof, or with mixtures of saturated and unsaturated acids or anhydrides thereof, with the introduction directly at the polycondensation stage of at least one divinyl ester of aliphatic dicarboxylic acids of the formula

$$CH_2{=}CHOOC(CH_2)_nCOOCH{=}CH_2$$

where n ranges from 3 to 8, said resins being used as a basis for preparing various laminated plastics, adhesives, varnishes and compounds.

3,660,529

REINFORCEMENT OF PLASTICS WITH SUSPENSION EMULSION INTERPOLYMERS

Frank O. Groch, Irvington, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.

No Drawing. Filed Feb. 16, 1970, Ser. No. 11,851
Int. Cl. C08f *37/18*
U.S. Cl. 260—876 R 25 Claims

Rigid plastics are reinforced by admixture with a plurality of rubber-containing interpolymer particles which are prepared by the suspension polymerization of a vinyl monomer, such as vinyl chloride, in the presence of an aqueous emulsion of particles comprising a hard inner core of a polymer having a glass transition temperature (Tg) above about 25° C. and an outer layer comprising a crosslinkable rubber having a Tg of less than about 25° C. The resulting reinforced plastics display excellent physical properties.

3,660,530

BLENDS OF ETHYLENE POLYMERS WITH POLYETHYLENE-POLYBUTENE-1 BLOCK COPOLYMERS HAVING IMPROVED STRESS CRACK RESISTANCE

Louis D. Hoblit and Carl P. Strange, Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of application Ser. No. 514,119, Dec. 15, 1965. This application Aug. 28, 1968, Ser. No. 755,831
Int. Cl. C08f *29/04, 29/10*
U.S. Cl. 260—876 10 Claims

Blends of ethylene polymers having improved stress crack resistance comprising a high density, high molecular weight polyethylene and a copolymeric constituent containing as an essential ingredient at least one block copolymer of polyethylene and a polymer of butene-1. A method for the preparation thereof which comprises (1) polymerizing ethylene to high density, high molecular weight polyethylene in the presence of a heterogeneous catalyst system, such as a mixture of triisobutyl aluminum and titanium tetrachloride, and a molecular weight control agent, such as hydrogen; (2) withdrawing a major part of the resulting polymer slurry from the polymerization zone; (3) introducing a gaseous alpha-olefin, such as butene-1, into the remaining portion of the still catalytically active polymer slurry and polymerizing the resulting mixture to obtain a block copolymer of polyethylene and a polymer of butene-1; and (4) admixing the withdrawn polymer slurry with the remaining polymer slurry.

3,660,531

THERMOPLASTIC RESIN BLEND OF POLYPHENYLENE OXIDE WITH BUTADIENE-CONTAINING POLYMERS

Robert L. Lauchlan, Granger, and Gray A. Shaw, South Bend, Ind., assignors to Uniroyal, Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 741,193, June 28, 1968. This application June 4, 1969, Ser. No. 830,472
Int. Cl. C08f *29/12, 41/12*
U.S. Cl. 260—876 B 51 Claims

Blends of thermoplastic polyphenylene oxide resin (which optionally contains an alkenyl aromatic polymer such as a styrene polymer) with butadiene homopolymers and copolymers are characterized by an unusually useful combination of properties, particularly low temperature melt processability in combination with high impact strength and flexural strength.

3,660,532

CASTABLE ELASTOMERS AND THEIR MANUFACTURE

Byron H. Werner, Akron, and Robert A. Hayes, Cuyahoga Falls, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

No Drawing. Filed Jan. 30, 1970, Ser. No. 7,271
Int. Cl. C08f *21/02*
U.S. Cl. 260—861 24 Claims

A polyester diol or a polyether diol or other diol is reacted with a monomeric unsaturated anhydride or acid chloride to produce a terminally unsaturated adduct hav-

ing a molecular weight of 2,000 to 20,000. On polymerization of this prepolymer with styrene or other vinyl monomer a castable, vulcanized elastomeric resin is obtained.

3,660,533

FLAME-RESISTANT BLOCK COPOLYMERS

William O. Drake and Donnie G. Brady, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed July 29, 1970, Ser. No. 59,347
Int. Cl. C08f *37/00, 45/00*
U.S. Cl. 260—878 B 6 Claims

Ethylene-propylene block copolymers are rendered flame-resistant by incorporation therein of a flame-retardant system consisting of a mixture of brominated and chlorinated bis(cycloalkenyl) compounds and antimony trioxide.

3,660,534

PROCESS FOR CONTROLLING MELT FLOW OF RUBBER-MODIFIED POLYMERS

Frederick E. Carrock, Paramus, and Kenneth W. Doak, Wyckoff, N.J., and Alfred J. Ackerman, Mentor, Ohio, assignors to Dart Industries Inc., Los Angeles, Calif.

No Drawing. Continuation-in-part of application Ser. No. 632,194, Apr. 20, 1967. This application July 9, 1970, Ser. No. 53,699
Int. Cl. C08f *15/04*
U.S. Cl. 260—880 R 3 Claims

The melt flow of rubber-modified polystyrene, ABS and the like is controlled by contacting polymerizable vinyl monomers with a chelating agent such as ethylenediaminetetraacetic acid and a mercaptan chain regulator such as tertiary dodecyl mercaptan in the presence of water and polymerizing the resulting mixture.

3,660,535

PROCESS FOR THE PRODUCTION OF ALKENYL AROMATIC POLYMERS CONTAINING A REINFORCING POLYMER THEREIN

Charles R. Finch and Jerold E. Kuntzsch, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of application Ser. No. 848,708, Aug. 8, 1969. This application Sept. 23, 1970, Ser. No. 74,846
Int. Cl. C08f *15/04*
U.S. Cl. 260—880 12 Claims

In a stratifying polymerization method for the preparation of styrene-type polymers polymerized in the presence of a reinforcing agent such as rubber, substantial control of the characteristics of the end product as well as particle size of the rubber is obtained by employing varying degrees of recirculation in an initial stage of a continuous polymerization.

3,660,536

PROCESS FOR MANUFACTURE OF POLYMERS OF CONJUGATED DIENES

Satoshi Ayano, Naka-gun, Kanagawa-ken, and Seizo Yabe, Yokohama-shi, Japan, assignors to Japan Gas-Chemical Company, Inc., Tokyo, Japan

No Drawing. Filed Dec. 27, 1968, Ser. No. 787,618
Claims priority, application Japan, Dec. 29, 1967, 43/84,844
Int. Cl. C08d *1/32*; C08f *15/04*
U.S. Cl. 260—880 R 6 Claims

A process for the manufacture of polymers of conjugated dienes which comprises polymerizing anion-polymerisable hydrocarbons of the conjugated diene series in a non-polar solvent in the presence of a catalytic amount of an adduct of lithium and hydrocarbon, said adduct being prepared by reacting metallic lithium with a polycyclic aromatic hydrocarbon having 10–30 carbon atoms in an aliphatic ether, removing from the reaction product insoluble matter, adding to the obtained solution 1–10 moles, per mole of the lithium in the solution, of an ethylenically unsaturated hydrocarbon selected from the group consisting of conjugated diene hydrocarbons, vinyl-substituted aromatic hydrocarbons and vinylidene-substituted aromatic hydrocarbons, and thereafter substantially removing the aliphatic ether from the resulting solution.

3,660,537

GRAFT COPOLYMERS CONTAINING ALLYL METHACRYLATE AND DIETHYLAMINOETHYL METHACRYLATE

Michael Fryd, Broomall, Pa., and Ying K. Lee, Cherry Hill, N.J., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Jan. 28, 1970, Ser. No. 6,571
Int. Cl. C08f *15/16, 15/18*
U.S. Cl. 260—885 7 Claims

Graft copolymers having a backbone which is a copolymer composed of monomer

(1) units of the esters of acrylic acid (AA) and methacrylic acid (MMA)
(2) allyl methacrylate (AMA) units, and optionally
(3) diethylaminoethyl methacrylate (DEAM) units

and polymeric graft segments composed of monomer units of 2-ethyl hexyl acrylate (2-EHA) and/or butyl acrylate (BA).

3,660,538

HEAT-RESISTANT COMPOSITION COMPRISING CHLORINATED POLYVINYL CHLORIDE AND COPOLYMER OF METHYL METHACRYLATE AND ALPHAMETHYL STYRENE

Toshiharu Matsumiya, Kawasaki-Nishi, Japan, assignor to Tokuyama Sekisui Kogyo Kabushiki Kaisha, Osaka-shi, Japan

No Drawing. Filed June 1, 1970, Ser. No. 42,577
Claims priority, application Japan, June 24, 1969, 44/49,846
Int. Cl. C08f *29/24*
U.S. Cl. 260—899 4 Claims

The present invention relates to a method for improving the heat resistance of chlorinated polyvinyl chloride resins by adding a copolymer of methyl methacrylate and α-methyl styrene to the polyvinyl chloride, and to a heat resistant resin composition formed of a blend of 80–97 parts of chlorinated polyvinyl chloride resin and correspondingly 20–3 parts of a copolymer of methyl methacrylate and α-methyl styrene.

3,660,539

PROCESS COMPRISING REACTION WITH ELEMENTAL PHOSPHORUS AND REACTION PRODUCT THEREOF

Chisung Wu, New Brunswick, N.J., assignor to Union Carbide Corporation, New York, N.Y.

No Drawing. Original application Feb. 15, 1966, Ser. No. 527,492. Divided and this application May 21, 1969, Ser. No. 826,676
Int. Cl. C07f *9/02, 9/28, 9/40*
U.S. Cl. 260—920 6 Claims

Organophosphorus compositions produced by reacting (a) elemental phosphorus, (b) an epoxide or an episulfide, and (c) an alcohol or a mercaptan, in the presence of a catalytic quantity of a base, are further reacted with an aldehyde to convert substantially all of the phosphinous hydrogen in said organophosphorus compositions

to hydroxymethyl (including substituted-hydroxymethyl) groups. The aldehyde-modified compositions can be oxidized to convert trivalent phosphorus to pentavalent phosphorus. The subject compositions and their oxidized derivatives can be reacted with ethylene oxide to form surfactants or with drying oil acids to form surface compositions.

3,660,540

O-LOWER ALKYL-O-(2 - CARBISOPROPOXY-PHENYL) PHOSPHORIC ACID DIESTER AMIDES

Wolfgang Hofer, Wuppertal-Elberfeld, Gerhard Schrader, Wuppertal-Cronenberg, and Ingeborg Hammann, Cologne, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed May 26, 1970, Ser. No. 40,736
Claims priority, application Germany, June 13, 1969, P 19 30 216.0
Int. Cl. C07f 9/12; A01n 9/36
U.S. Cl. 260—941 9 Claims

O-lower alkyl-O-(2-carbisopropoxyphenyl) phosphoric acid diester amides wherein the amide group may be mono-substituted with a lower alkyl radical, which possess arthropodicidal, especially acaricidal and insecticidal, properties and new methods for their preparation.

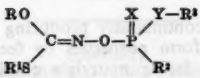
3,660,541

OXIMINO PHOSPHATES AND PHOSPHONATES

Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

No Drawing. Filed Apr. 6, 1970, Ser. No. 26,070
Int. Cl. C07f 9/16; A01n 9/36
U.S. Cl. 260—944 3 Claims

Compounds having the formula



in which X is oxygen or sulfur; Y is oxygen or sulfur; R is alkyl; R^1 is alkyl; R^2 is alkyl or alkoxy and R^3 is (1) phenyl, or (2) mono-, di- or tri-substituted phenyl wherein the substituent is (a) nitro or (b) halogen, and their use as insecticides, and acaricides are disclosed. Also, the intermediates for preparing the compounds and a method for preparing the intermediates are disclosed.

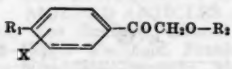
3,660,542

ALKYLBENZOYLCARBINOL PHOSPHATE ESTERS

Haruhiko Adachi, Kobe, and Takuichi Miki, Amagasaki, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

No Drawing. Original application Oct. 30, 1967, Ser. No. 679,206. Divided and this application Dec. 11, 1969, Ser. No. 889,785
Int. Cl. A01n 9/36; C07f 9/08
U.S. Cl. 260—946 10 Claims

Alkylbenzoylcarbinol esters of the formula



wherein R_1 is a hydrocarbon residue having from 3 to 10 carbon atoms, R_2 is an acyl of a carboxylic acid having up to 10 carbon atoms or an inorganic radical derived from an inorganic polybasic acid by the removal of OH therefrom, and X is hydrogen or halogen attached in ortho- or meta-position to the group R_1 in the benzene ring, have hypothermic or anti-inflammatory activity with low toxicity to mammals.

3,660,543

S-2-HYDROCARBYLTHIO-ALKYL ESTERS OF THIOPHOSPHORUS ACIDS

Wolfgang H. Mueller, Elizabeth, Warren A. Thaler, Matawan, and Alexis A. Oswald, Mountainside, N.J., assignors to Esso Research and Engineering Company

No Drawing. Filed Mar. 4, 1969, Ser. No. 805,115
Int. Cl. C07f 9/16; A01n 9/36
U.S. Cl. 260—948 14 Claims

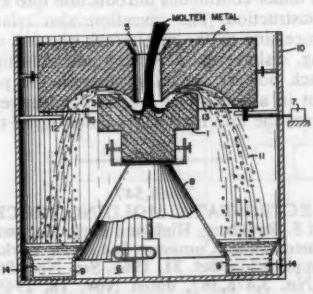
Neutral S-2-hydrocarbylthioalkyl esters of thiophosphorous acids are prepared through the displacement reaction of a 2-hydrocarbyl-2-hydrocarbylthioethyl halide alone or in admixture with the corresponding isomeric secondary halide compound with a diorgano thiophosphate, thiophosphonate or thiophosphinate salt. The displacement reactions are conducted at moderate temperatures and pressures, preferably in the presence of a polar diluent. The preferred thiophosphorus acid salt reactants are salts of dialkyl dithiophosphoric acids and dialkyl monothiophosphoric acids. The preferred halide reactants are 2-alkyl-2-alkylthioethyl chlorides alone or in combination with 1-alkyl-2-alkylthioethyl chlorides. The compounds derived from the displacement reactions possess particularly good pesticidal activity.

3,660,544

PROCESS FOR PRODUCING SIZED FERROALLOY PARTICLES

Claude Frank Young and Charles Martin Offenhauer, Niagara Falls, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 15, 1970, Ser. No. 28,594
Int. Cl. B01j 2/14
U.S. Cl. 264—8 7 Claims



A process for disintegrating a stream of molten ferroalloy into solidified spheroidal to spherical configurations for use as additives in metal producing furnace operations or the like.

3,660,545

METHOD OF CENTRIFUGALLY CASTING THIN EDGED CORNEAL CONTACT LENSES

Otto Wichterle, Prague, Czechoslovakia, assignor to Ceskoslovenska Akademie Ved

Continuation of application Ser. No. 810,072, Jan. 31, 1969, which is a division of application Ser. No. 318,627, Oct. 24, 1963, which in turn is a continuation-in-part of application Ser. No. 229,727, Oct. 10, 1962. This application Nov. 4, 1970, Ser. No. 86,942
Claims priority, application Czechoslovakia, Dec. 27, 1961, 7,654/61
The portion of the term of the patent subsequent to Oct. 29, 1985, has been disclaimed
Int. Cl. B29d 11/00
U.S. Cl. 264—1 8 Claims

A corneal contact lens is made by polymerizing a catalyzed mixture of acrylates and/or methacrylates of polyhydric alcohols with a water miscible solvent in a mold

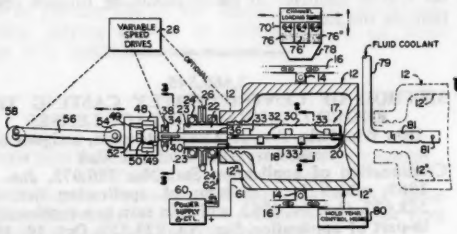
cavity having a spherically concave bottom surface and being rotated about an axis perpendicular to that surface at a speed to produce an exposed concave surface of the

polymerization mixture, which is sufficiently different from a paraboloid shape because of surface tension effects to have a center effective as a corrective lens.

3,660,546
PROCESS FOR THE PREPARATION OF BLACK POWDER
Kjell Lövold, Nittedal, Norway, assignor to Norsk Spraengstofindustri A/S, Oslo, Norway
Filed Feb. 4, 1970, Ser. No. 8,540
Int. Cl. C06b *21/02*
U.S. Cl. 264—3 C **5 Claims**

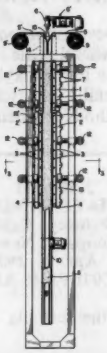
The present invention relates to a process for the preparation of meal black powder from the raw materials potassium nitrate, sulphur and activated carbon, wherein the raw materials are mixed and simultaneously ground and pulverized under continuous introduction into a jet mill of known construction. The invention also relates to the further processing of the meal black powder, comprising compacting, disintegration, sieving and polishing the obtained black powder granules, wherein the polishing is carried out in a similar jet mill and pulverized graphite is blown into the mill for further polishing of the powder granules.

3,660,547
ELECTROSTATIC MOLDING PROCESS
Herbert S. Ruekberg, Highland Park, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Original application Oct. 21, 1965, Ser. No. 499,893, now Patent No. 3,478,387, dated Nov. 18, 1969. Divided and this application June 2, 1969, Ser. No. 839,764
Int. Cl. B26b *5/04*
U.S. Cl. 264—24 **22 Claims**



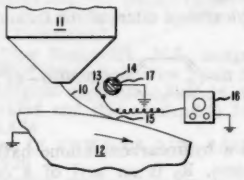
A method for producing containers wherein a charged comminuted material is introduced into a channel having a similar charge. The channel is positioned within a mold having a potential of opposite charge. The material is agitated in the channel to assist in the electrostatic distribution of the material in the mold. The temperature of the mold is controlled to fuse the deposited material in the form of a container and in the fused container is removed from the mold. The method may be used for the fabrication of plastic containers, fiber reinforced containers and foamed wall containers.

3,660,548
METHOD FOR CONTINUOUSLY PRODUCING FOAMED PANELS HAVING UNIFORM PROPERTIES
Hiroshi Komada, Akashi, and Kuniyasu Nakamura, Hyogo, Japan, assignors to The Toyo Rubber Industry Co., Ltd., Osaka, Japan
Continuation-in-part of abandoned application Ser. No. 408,006, Nov. 2, 1964. This application June 11, 1969, Ser. No. 832,393
Claims priority, application Japan, Nov. 6, 1963, 38/59,997
Int. Cl. B29d *27/04*
U.S. Cl. 264—47 **5 Claims**



A method for continuously producing foamed plastic panels having uniform properties by feeding a pair of sheets of flexible facing materials continuously downwardly into a space between two downwardly running conveying means through the upper end of the space, joining the side edges of the two sheets of facing material to form a tubular container, and running the conveying means to convey the foaming liquid material and the facing materials downwardly, whereby panels having flexible sheet material on both surfaces and a foam core are produced from the lowest end of the conveying means.

3,660,549
ELECTROSTATIC PINNING OF DIELECTRIC FILM
William E. Hawkins, Circleville, Ohio, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of application Ser. No. 823,810, May 12, 1969. This application Mar. 23, 1970, Ser. No. 21,694
Int. Cl. B29d *7/02*
U.S. Cl. 264—22 **12 Claims**



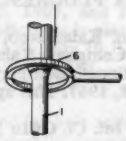
A process for electrostatically pinning a moving dielectric web to a roll which comprises establishing a potential difference between a pinning wire and a second electrode independent of the roll, and preferably surrounding at least the first electrode with a gas in which a specific minimum current can be generated.

3,660,550

DRAWING OF THERMOPLASTIC SYNTHETIC LINEAR POLYMERIC THREAD AND LOCALIZING THE NECK PORTION OF THE THREAD

Hendrinus Sempel, Arnhem, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

Filed Oct. 7, 1969, Ser. No. 864,453
Claims priority, application Netherlands, Oct. 8, 1968, 6814351
Int. Cl. B29c *17/02*; B29d *23/13*; G01k *13/06*; G01n *25/00*
U.S. Cl. 264—40 3 Claims



A process for drawing a thermoplastic synthetic linear polymeric thread which comprises feeding the thread to a drawing zone; subjecting the thread to an axial load in the drawing zone whereby the thread necks down and is permanently deformed to form a neck portion therein; localizing the neck portion of the thread in the drawing zone and discharging the thread from the drawing zone. The neck portion in the thread is localized by measuring the temperature of the thread at the point where the neck portion is desired to be positioned, and when the neck portion moves away from its desired position, by changing at least one process parameter that affects the position of the neck in response to the temperature measurement so that the neck portion is caused to return to its desired position. Also an apparatus for carrying out this process and the resulting drawn thread are disclosed.

3,660,551

METHOD OF IMPROVING PROPERTIES OF POLYOLEFIN SHEET

Rinnosuke Susuki, Tokyo, Hiroshi Hoshi, Narashino-shi, Jiro Saito, Tokyo, Humio Ito, Ishikawa-shi, and Keiichi Murakami, Sendai-shi, Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

No Drawing. Filed Dec. 15, 1969, Ser. No. 885,341
Claims priority, application Japan, Dec. 21, 1968, 43/93,777; Dec. 23, 1968, 43/93,871; May 13, 1969, 44/36,188
Int. Cl. B29d *7/14, 27/00*; C08 *47/22*
U.S. Cl. 264—49 5 Claims

A method of improving the properties of polyolefin sheet characterized by the steps that: a polyolefin resin such as polyethylene, polypropylene or a copolymer of ethylene and propylene containing calcium sulfite or polyvinyl acetate together with said calcium sulfite is subjected to calendering or extrusion molding to form a sheet and the sheet is subjected to treatment with an inorganic acid or an aqueous solution of phosphate.

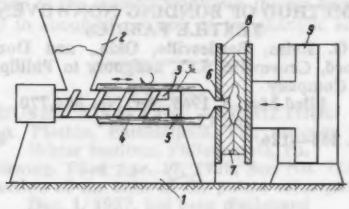
3,660,552

PROCESS OF MANUFACTURING CROSS-LINKED MOLDED ARTICLES

Eberhard Hinz, Neu Isenburg, Helmut Kaufer, Metzkausen, and Reiner Theobald, Frankfurt, Germany, assignors to Vereinigte Deutsche Metallwerke AG, Frankfurt am Main, Germany

Filed Mar. 19, 1970, Ser. No. 21,061
Claims priority, application Germany, Mar. 25, 1969, P 19 15 033.5
Int. Cl. B29f *1/08*
U.S. Cl. 264—68 7 Claims

Improved process of forming cross-linked thermoplastic polymer molded articles by mixing the thermoplastic and a suitable free radical initiating cross-linking agent, both in solid form, at a temperature below the actuation temperature of the free radical generator and below the heat plasticization temperature of the thermoplastic polymer; injecting such mixture through a nozzle into a preheated mold under such conditions as to heat the molding material mixture passing through the nozzle to a temperature which is above the activation temperature of the free radical generator and above the melting point of the thermoplastic polymer; and holding the molding material mixture in the mold at a temperature and for a time sufficient to at least initiate cross-linking and formation of said molded article.

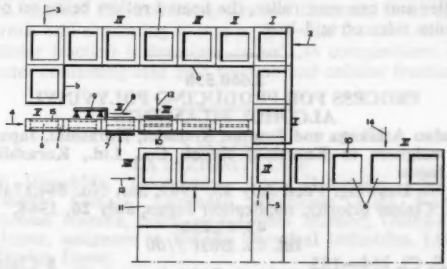


3,660,553

METHOD FOR MANUFACTURING ARTICLES FROM A HARDENING SUBSTANCE

Dirk Kalkman, Krimpen aan den Ijssel, Netherlands, assignor to N.V. Machinefabriek Gebr. Kalkman, Krimpen aan den Ijssel, Netherlands

Filed Aug. 21, 1969, Ser. No. 851,917
Claims priority, application Netherlands, Aug. 22, 1968, 6811992
Int. Cl. B28b *11/08*
U.S. Cl. 264—71 5 Claims



A method of manufacturing concrete tiles on a production line basis. Molds with removable bottom plates are filled and packed with concrete. The molds are then tilted to a vertical position where the bottom plate is removed while an additional plate is placed on the other side. The mold is then returned to a horizontal position on top of the newly added plate and the mold frame is removed leaving the desired tile shape to set.

3,660,554

PROCESS FOR THE PREPARATION OF SHAPED MATERIALS OF AMIDOVINYL COMPOUND-GRAFTED AROMATIC POLYESTERS

Takayuki Okamura, Kurashiki, Japan, assignor to Kurashiki Rayon Co., Ltd., Kurashiki, Japan

No Drawing. Filed July 15, 1969, Ser. No. 841,979
Claims priority, application Japan, July 17, 1968, 43/50,331
Int. Cl. D01f *7/06*; B29c *25/00*
U.S. Cl. 264—78 7 Claims

A process for the preparation of an amidovinyl compound-grafted shaped material of aromatic polyester, which comprises heating a shaped material of aromatic polyester at a temperature of 60–150° C., while keeping it in contact with a solvent containing at least one amido-

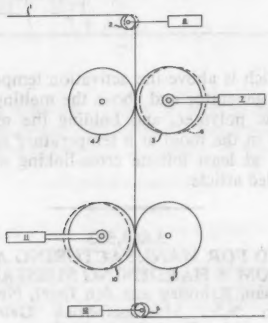
vinyl compound, the solvent being such that the solubility of the amidovinyl compound therein is 0.1–50 g. per 100 cc. at 45° C., and the degree of swelling of the shaped material with the solvent is 0.5–20% at 60° C.

3,660,555

METHOD OF BONDING NONWOVEN TEXTILE FABRICS

Cloral O. Rains, Bartlesville, Okla., and Donald M. McCord, Greenville, S.C., assignors to Phillips Petroleum Company

Filed Mar. 6, 1969, Ser. No. 804,770
Int. Cl. B29d *7/14*
U.S. Cl. 264—126 **8 Claims**



A batt of fibers containing at least some thermoplastic fibers arranged in either ordered or random orientation is bonded into a coherent batt by passing the batt through the nip of two pairs of rollers comprising one heated roller and one cool roller, the heated rollers being on opposite sides of said batt.

3,660,556

PROCESS FOR PRODUCING POLYVINYL ALCOHOL FILAMENTS

Tadao Ashikaga and Susumu Kousaka, Kurashiki, Japan, assignors to Kurashiki Rayon Co., Ltd., Kurashiki, Japan

No Drawing. Filed July 23, 1969, Ser. No. 844,174
Claims priority, application Japan, July 26, 1968, 43/53,230
Int. Cl. D01f *7/00*
U.S. Cl. 264—185 **5 Claims**

A process for producing polyvinyl alcohol filaments of circular cross-section excelling in drawability which comprises using as a spinning solution an aqueous polyvinyl alcohol solution of 10–30 weight percent concentration containing 1–5 weight percent, based on the polyvinyl alcohol, of a water-soluble boric acid compound, the pH of said solution being adjusted to 3–5, and spinning said aqueous polyvinyl alcohol solution from circular spinning holes into an aqueous coagulating bath containing 20–100 grams per liter of an alkali hydroxide and 100–180 grams per liter of sodium sulfate, the pH of said bath being adjusted to 13.5–14.

3,660,557

POLYESTER PRODUCT

Walter J. Smith, Hopewell, Va., and John R. Bukey, Pottstown, Pa., assignors to The Firestone Tire & Rubber Company

No Drawing. Continuation of application Ser. No. 743,637, July 10, 1968, which is a division of application Ser. No. 483,318, Aug. 27, 1965. This application Nov. 12, 1970, Ser. No. 89,027
Int. Cl. D01d *5/12*
U.S. Cl. 264—210 **3 Claims**

By incorporating by melt-blending certain diamides in predominantly polyester fiber-forming compositions, the fibers, filaments, yarn, cord, strapping and the like produced therefrom may be drawn at a draw ratio exceeding the draw ratio at break for the base polymeric material. The tensile strength of the product, as a result of the drawing operation, is greater than is obtainable from the base polymeric material. N,N'-ethylene bis-stearamide is a particularly suitable diamide for this purpose.

3,660,558

DETERMINATION OF CAPACITATION OF SPERM EMPLOYING A FLUORESCENT FORM OF TETRACYCLINE

Ronald J. Ericsson, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Continuation-in-part of application Ser. No. 639,318, May 18, 1967. This application May 11, 1970, Ser. No. 36,446
Int. Cl. G01n *31/22*
U.S. Cl. 424—7 **4 Claims**

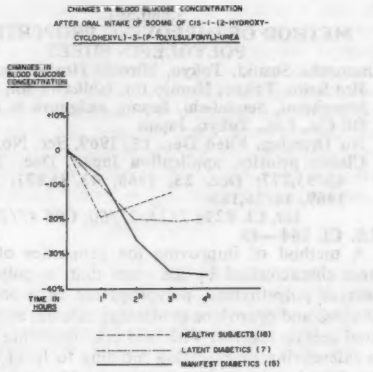
A complex of mammalian sperm with an effective amount of a fluorescent form of a tetracycline for imparting to the complex fluorescence during absorption of ultraviolet or ultraviolet-blue light is used in a method of diagnosing sperm capacitation. The method consists essentially of placing the complex in the mammalin uterus in vivo for a period of from about 2 to about 8 hours, removing the complex from the uterus, and determining the presence or absence of fluorescence in the removed complex.

3,660,559

DIAGNOSTIC METHOD

Herbert Alfred Buckert, Basel, and Eckehard Lorch, Reinach, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed June 22, 1970, Ser. No. 48,227
Int. Cl. G01n *31/00, 33/16*
U.S. Cl. 424—9 **5 Claims**



A method for the detection of diabetes utilizing cis-1 - (2 - hydroxycyclohexyl) - 3 - (p-tolylsulfonyl)-urea is described.

3,660,560

1-p-CHLOROPHENYL - 1,3,3-TRIMETHYL-1,3-PROPANE-DIOL OR THE TREATMENT OF DEPRESSIVE STATES

Raymond Valette, Paris, France, assignor to Albert Rolland S.A., Paris, France

No Drawing. Application Aug. 2, 1968, Ser. No. 749,574, which is a continuation-in-part of application Ser. No. 262,849, Mar. 5, 1963. Divided and this application Nov. 20, 1970, Ser. No. 91,529
Int. Cl. A61k *27/00*
U.S. Cl. 424—343 **3 Claims**

This invention relates to a pharmaceutical composition containing in association with a physiologically inert car-

rier from 1 to 95% by weight of 1-p-chlorophenyl-1,3,3-trimethyl-1,3-propane-diol, as an active ingredient.

3,660,561
HAIR SPRAY
Thomas H. Shepherd, Hopewell, and Francis E. Gould, Princeton, N.J., assignors to National Patent Development Corporation, New York, N.Y.
No Drawing. Continuation-in-part of applications Ser. No. 567,856, July 26, 1966, now Patent No. 3,520,949, Ser. No. 650,259, June 30, 1967, and Ser. No. 654,044, July 5, 1967. This application is also a division of application Ser. No. 743,626, July 10, 1968. This application Sept. 9, 1970, Ser. No. 70,889
Int. Cl. A61k 7/10
U.S. Cl. 424—47 10 Claims

A hair straightening and/or hair setting formulation is prepared by adding a hydrophilic acrylate or methacrylate to an appropriate cosmetic formulation.

3,660,562
METHOD AND COMPOSITIONS FOR IMPROVING FEED EFFICIENCY OF RUMINANTS
George M. Grass, Jr., Phoenixville, Roger C. Parish, King of Prussia, and John E. Trei, Malvern, Pa., assignors to Smith Kline & French Laboratories, Philadelphia, Pa.
No Drawing. Filed June 24, 1970, Ser. No. 49,558
Int. Cl. A23k 1/175
U.S. Cl. 424—78 9 Claims

Compositions and a method of improving feed efficiency of ruminant animals by inhibiting methanogenesis in the rumen utilizing encapsulated or coated volatile liquid or solid hydrocarbons having at least two halo atoms and from one to six carbon atoms. Preferred compounds to be used as the active ingredient are chloroform, carbon tetrachloride, methylene chloride and hexachloroethane.

3,660,563
WATER SOLUBLE ENTRAPPING OF A DRUG
Francis E. Gould, Princeton, and Thomas H. Shepherd, Hopewell, N.J., assignors to National Patent Development Corporation, New York, N.Y.
No Drawing. Continuation-in-part of applications Ser. No. 567,856, July 26, 1966, now Patent No. 3,520,949, Ser. No. 650,259, June 30, 1967, and Ser. No. 654,044, July 5, 1967. This application is also a division of application Ser. No. 833,182, June 13, 1969, now Patent No. 3,576,760. This application Sept. 9, 1970, Ser. No. 70,941
Int. Cl. A61k 9/00
U.S. Cl. 424—81 4 Claims

Materials are entrapped in water soluble hydroxyalkyl acrylate or methacrylate polymers to provide ready sources of the material by the deletion of water. Thus, there can be entrapped drugs, pesticides, flavoring agents and fragrances.

3,660,564
INTERFERON INDUCTION
Masahiko Yoneda, Kobe, Hideaki Yaoi, Nara, Makoto Kida and Shinobu Matsuda, Osaka-fu, and Hideo Shirafuji, Kyoto-fu, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan
No Drawing. Filed Dec. 23, 1969, Ser. No. 887,779
Claims priority, application Japan, Dec. 24, 1968, 43/94,828
Int. Cl. A61k 27/00
U.S. Cl. 424—85 13 Claims

A method for inducing interferon formation in vivo and in vitro. To a host or a tissue culture is administered a double-stranded complex of (a) heteropolynucleotide essentially consisting of inosinic acid and guanylic acid as its nucleotide units and (b) homopolynucleotide essentially consisting of cytidylic acid as its nucleotide unit, the heteropolynucleotide (a) being of a sedimentation constant falling within the range from about 2S to about 15S in terms of Svedberg units, and the ratio of the average number of the inosinic acid units therein being from about 0.7 to about 20 per unit of the guanylic acid.

3,660,565
RUBELLA VACCINE AND METHOD
Stanley A. Plotkin, Philadelphia, Pa., assignor to The Wistar Institute, Philadelphia, Pa.
No Drawing. Filed Apr. 17, 1968, Ser. No. 721,926
The portion of the term of the patent subsequent to Dec. 1, 1987, has been disclaimed
Int. Cl. C12k 5/00, 7/00
U.S. Cl. 424—89 1 Claim

A rubella vaccine, capable of inducing immunity in humans, without spread to contacts and with reduced nasopharyngeal excretion of virus, is prepared by passing rubella virus in WI–38 human diploid lung fibroblasts.

3,660,566
EXTRACTION OF LIPID AND CELLULAR FRACTIONS FROM THE STRATUM CORNEUM OF ANIMAL SKIN
Leonard J. Vinson, Glen Rock, and Thomas Masurat, Fort Lee, N.J., assignors to Lever Brothers Company, New York, N.Y.
Continuation of application Ser. No. 351,010, Mar. 11, 1964. This application June 12, 1969, Ser. No. 835,895
Int. Cl. A61k 11/00
U.S. Cl. 424—95 4 Claims

A method for extracting stratum corneum from epidermis and separating it into a lipid-rich fraction and a cellular fraction is described as well as compositions of matter containing said lipid fraction and cellular fraction.

3,660,567
LATERIOMYCIN F
Eiji Higashide, Takarazuka, Toru Hasegawa, Osaka, Motoo Shibata, Toyonaka, Toyokazu Kishi, Nara, Setsuo Harada, Suita, and Komei Mizuno, Osaka-fu, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan
Filed Apr. 3, 1967, Ser. No. 627,772
Claims priority, application Japan, Apr. 2, 1966, 41/20,858; Apr. 20, 1966, 41/25,406
Int. Cl. A61k 21/00
U.S. Cl. 424—122 1 Claim

Lateriomycin F, produced by incubating a Lateriomycin F-producing strain of *Streptomyces griseoruber* in a culture medium at a temperature of about 25° C. to 35° C. under aerobic conditions until Lateriomycin F is accumulated in the culture broth and recovering thus accumulated Lateriomycin F therefrom, is useful as a disinfectant, in the treatment of Staphylococcus infections, and as an antibiotic in the treatment of experimental tumors.

3,660,568
ANTI-INFLAMMATORY SUBSTANCE, ZYGOSPORIN A, AND PRODUCTION THEREOF
Shohei Hayakawa and Takashi Matsushima, Amagasaki-shi, Hitoshi Minato, Toyonaka-shi, and Katsumi Hirose, Nishinomiya-shi, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan
No Drawing. Filed Mar. 25, 1968, Ser. No. 715,913
Int. Cl. A61k 21/00
U.S. Cl. 424—122 7 Claims

An anti-inflammatory agent, zygosporin A, is prepared by aerobically culturing a zygosporin-producing strain of

Zygosporium masonii or of *Zygosporium mycophilum* in an aquous nutrient medium, and recovering the accumulated agent from the fermentation broth. The antiinflammatory agent is advantageously administered orally or subcutaneously.

3,660,569
PROCESS FOR SEPARATING MOENOMYCIN
Ulrich Schacht, Bad Soden, Taunus, Rudolf Tschesche, Rottgen, and Ingolf Duphorn, Villip, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany
No Drawing. Filed Nov. 30, 1965, Ser. No. 510,689
Claims priority, application Germany, Dec. 10, 1964, F 44,660
Int. Cl. A61k *21/00*
U.S. Cl. 424—124 **1 Claim**

Three components of Moenomycin having molecular weights of 68,000 to 70,000, practically identical infrared spectra and elementary analyses, and a method for separating said components from pure Moenomycin.

3,660,570
TREATMENT FOR HEART WORM MICROFILARIAE
Marguriette N. Davis, Rte. 2, P.O. Box 356, Theodore, Ala. 36582
No Drawing. Continuation-in-part of application Ser. No. 541,901, Mar. 21, 1966. This application Sept. 24, 1968, Ser. No. 762,152
Int. Cl. A61k *27/00*
U.S. Cl. 424—147 **5 Claims**

An aqueous composition useful for treating animals for heart worm microfilariae prepared by reacting in an aqueous medium, tobacco, Epsom salts, hydrated lime, sulfur, ferrous sulfate and turpentine.

3,660,571
DISEASE CONTROL COMPOSITION FOR SILKWORMS
Reijiro Kodama, Kyoto-fu, Yugoro Nakasuji, Toyonaka, and Kosaku Imanishi, Tokyo, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan
No Drawing. Filed Mar. 26, 1969, Ser. No. 810,802
Claims priority, application Japan, Mar. 28, 1968, 43/20,288; June 12, 1968, 43/40,491
Int. Cl. A61k *27/00*
U.S. Cl. 424—181 **10 Claims**

Silkworm diseases, and more especially flacherie, are controlled by a composition consisting essentially of silkworm feedstuff and a minor but effective amount of triphenylmethane dyestuff with or without a minor amount of macrolide antibiotic and of fructosazine.

3,660,572
INSECTICIDAL COMPOSITION
Ludwig Friedrich Emmel, Bergen-Enkheim, Germany, and Dieter Kaeding, Binningen, Switzerland, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany
No Drawing. Filed Oct. 24, 1969, Ser. No. 869,381
Claims priority, application Germany, Nov. 7, 1968, P 18 07 567.7
Int. Cl. A01n *9/36*
U.S. Cl. 424—200 **1 Claim**

Novel pesticidal compositions are described containing 4 - (O,O - dimethylphosphoryl)-5-chloro-bicyclo-[3,2,0]-heptadiene-1,4 in admixture with

(a) 1 - phenyl-3-(O,O-diethyl-thionophosphoryl)-1,2,4-triazole or with

(b) O,O-dimethyl - (1 - hydroxy-2,2,2-trichloroethyl)-phosphonic acid ester, or with

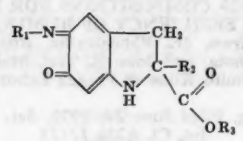
(c) O,O-dimethyl-S - (3,4 - dihydro - 4 - oxo - 1,2,3-benzotriazine - 3 - yl methyl)-dithiophosphoric acid ester, or with

(d) O,O-dimethyl-S - (5 - methoxy-1,3,4-thiadiazole-2-(3H)-one-3-yl-methyl)-dithiophosphoric acid ester.

The compositions are effective in low concentrations against a large number of pests, especially insects, mites and acarids.

3,660,573
STABLE AMINOCHROME-LIKE COMPOUNDS RESULTING FROM MILD OXIDATION OF DOPA AND REACTION WITH KETONIC REAGENTS
Norman Barsel, 133—17 Francis Lewis Blvd., Laurelton, N.Y. 11413
No Drawing. Filed Feb. 26, 1968, Ser. No. 707,987
Int. Cl. A61k *27/00*
U.S. Cl. 424—232 **3 Claims**

Stable aminochrome-type structures of the general formula



where R_1—N results from reaction of 5-keto group of aminochrome with nitrogen-containing reagent selected from the group consisting of hydroxylamine, hydrazine, parahydrazine benzoic acid, parahydrazine salicylic acid, methyl phenyl hydrazine, nitro-phenyl hydrazine, phenyl hydrazine, semicarbazide, thiosemicarbazide and isonicotinic acid hydrazine, R_2 is a member of the group consisting of hydrogen and methyl, and R_3 is a member of the group consisting of hydrogen, alkali metal and ammonium, prepared by oxidizing β-(3,4-dihydroxy phenyl alanine) under mild conditions with an agent selected from the group consisting of alkali metal ferricyanide in alkali bicarbonate buffer and alcoholic silver oxide under acidity and temperature conditions to minimize decomposition and produce a clear solution, separating any precipitates which form to maintain this clear solution whereby an aminochrome-type structure is formed, adjusting the pH to 2 to 4, and adding a nitrogen-containing reagent which reacts with the 5-keto group present in the aminochrome-type structure. The compounds of the formula are useful as acid-base indicators and certain of the compounds are useful as central nervous system stimulants and anti-hypertensive agents.

3,660,574
METHOD OF CONTROLLING FERTILITY EMPLOYING QUINGESTANOL ACETATE
Edel Berman, Morristown, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.
No Drawing. Filed Sept. 11, 1969, Ser. No. 857,215
Int. Cl. A61k *27/00*; C07c *169/00*
U.S. Cl. 424—238 **1 Claim**

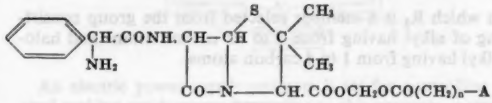
A method is described for controlling the incidence of pregnancy. The method comprises the oral ingestion, by fertile women of child-bearing age within twenty-four hours after coitus, of a pharmaceutical composition containing, as the sole active ingredient, from about 0.5 mg. to about 1.0 mg., and preferably, from about 0.5 mg. to about 0.8 mg., of quingestanol acetate.

3,660,575
ESTERS OF α-AMINOBENZYLPENICILLIN IN DOSAGE UNIT FORM

Erling Knud Frederiksen, Holte, and Wagn Ole Godtfredsen, Vaerlose, Denmark, assignors to Lovens kemiske Fabrik Produktionsaktieselskab, Ballerup, Denmark

No Drawing. Filed Sept. 26, 1968, Ser. No. 763,010
Claims priority, application Great Britain, Sept. 29, 1967, 44,535/67; Oct. 5, 1967, 45,600/67; Oct. 23, 1967, 48,127/67; Nov. 10, 1967, 51,358/67; Dec. 6, 1967, 55,489/67; Jan. 3, 1968, 499/68; Mar. 22, 1968, 14,041/68; Mar. 29, 1968, 15,312/68
Int. Cl. A61k *21/00*
U.S. Cl. 424—271 **4 Claims**

The invention relates to a pharmaceutical composition having antibacterial activity, and to the composition in dosage unit form for use in the treatment of infectious diseases, comprising, as an active ingredient a new ester of α-aminobenzylpenicillin of the general formula:



(I)

in which *n* is an integer from 0 to 5, and A is an unsubstituted or substituted aliphatic, alicyclic, aromatic, or heterocyclic radical, or a salt of such ester with a pharmaceutically acceptable acid, and an atoxic, pharmaceutically acceptable carrier, the quantity of the active ingredient in a dose being between 100 mg. and 800 mg.

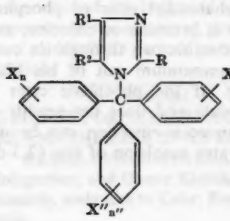
The invention also relates to a method of treating patients suffering from infectious diseases with the dosage units in question, administering from 500 to 5000 mg. per day of the active component.

3,660,576
N-TRITYL-IMIDAZOLES FOR TREATING FUNGAL INFECTIONS

Karl H. Buchel, Leverkusen, and Manfred Plempel, Wuppertal-Elberfeld, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Original application Sept. 9, 1968, Ser. No. 758,594. Divided and this application May 11, 1970, Ser. No. 36,396
Claims priority, application Germany, Sept. 15, 1967, F 53,504
Int. Cl. A61k *27/00*
U.S. Cl. 424—273 **10 Claims**

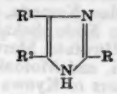
N-trityl-imidazoles and salts thereof of the formula:



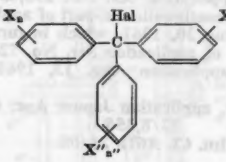
wherein R, R^1 and R^2 are hydrogen, lower alkyl or phenyl, or R^1 and R^2 together form an anellated benzene ring,

X, X′ and X″ are alkyl of 1 to 12 carbon atoms or an electro-negative moiety, and

n, *n*′ and *n*″ are an integer from 0 to 2, or pharmaceutically acceptable acid salts thereof may be produced by reacting a silver salt or alkali metal salt of an imidazole of the formula:



with a trityl halide of the formula:



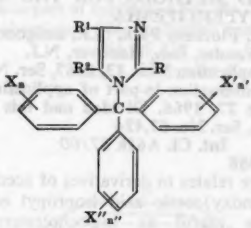
wherein the substituents are as above defined and Hal is halogen. These compounds are useful as antimycotics.

3,660,577
N-TRITYL-IMIDAZOLES AS ANTIFUNGAL AGENTS

Karl-Heinz Buchel, Leverkusen, Erich Regel, Wuppertal-Kronenberg, and Manfred Plempel, Wuppertal-Elberfeld, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Sept. 9, 1968, Ser. No. 758,594
Claims priority, application Germany, Sept. 15, 1967, F 53,504
Int. Cl. A61k *27/00*
U.S. Cl. 424—273 **36 Claims**

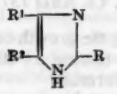
N-trityl-imidazoles and salts thereof of the formula:



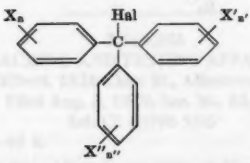
wherein R, R^1 and R^2 are hydrogen, lower alkyl or phenyl, or R^1 and R^2 together form an anellated benzene ring,

X, X′ and X″ are alkyl of 1 to 12 carbon atoms or an electro-negative moiety, and

n, *n*′ and *n*″ are an integer from 0 to 2, or pharmaceutically acceptable acid salts thereof may be produced by reacting a silver salt or alkali metal salt of an imidazole of the formula:



with a trityl halide of the formula:



wherein the substituents are as above defined and Hal is halogen. These compounds are useful as antimycotics.

3,660,578

MITOMYCIN C

Toju Hata, Tokyo, Hideo Kamada, Obe-shi, Shigetoshi Wakaki, Tokyo, Shiro Kudo, Sakai-shi, Keitaro Tomioka, Yokkaichi-shi, Hirofuto Marumo, Shizuoka-ken, Eturo Kato, Hofu-shi, and Motoaki Shimizu, Yokkaichi-shi, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., and Kitasato Kenkyusho (Shadan Hojin), both of Tokyo, Japan

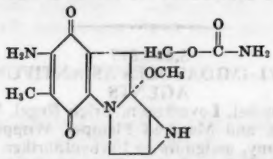
Continuation of application Ser. No. 295,031, July 15, 1963, which is a continuation-in-part of application Ser. No. 121,178, June 30, 1961, which in turn is a continuation-in-part of application Ser. No. 726,189, Apr. 3, 1958. This application Aug. 13, 1968, Ser. No. 752,203

Claims priority, application Japan, Apr. 6, 1957, 32/8,456

Int. Cl. A61k *21/00*

U.S. Cl. 424—274 13 Claims

A therapeutically active compound designated Mitomycin C having the formula



This compound is prepared by culturing *Streptomyces caespitosus* in a liquid nutrient medium.

3,660,579

DERIVATIVES OF ACETIC ACID IN COMPOSITIONS AND METHODS FOR THE ALLEVIATION OF HYPERLIPEMIA

Rudolf G. Griot, Florham Park, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Application Nov. 13, 1967, Ser. No. 682,647, which is a continuation-in-part of application Ser. No. 560,874, June 27, 1966. Divided and this application June 15, 1970, Ser. No. 57,424

Int. Cl. A61k *27/00*

U.S. Cl. 424—308 22 Claims

This disclosure relates to derivatives of acetic acid, e.g., bis(p-chlorophenoxy)acetic acid isopropyl ester. These compounds are useful as hypocholesteremics/hypolipemics.

3,660,580

USE OF CERTAIN OXIME ESTERS IN CONTROLLING FUNGI UPON CELLULOSIC MATERIALS

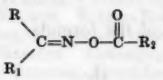
Don R. Baker, Pinole, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

No Drawing. Continuation of application Ser. No. 649,023, June 26, 1967. This application Nov. 24, 1969, Ser. No. 873,727

Int. Cl. A61l *13/00*

U.S. Cl. 424—327 8 Claims

Method of inhibiting the growth of fungi upon cellulosic materials by applying thereto an effective amount of the compound having the formula



in which R and R_1 are independently selected from the group consisting of alkyl having from 1 to 4 carbon atoms, haloalkyl having from 1 to 4 carbon atoms, alkenyl having from 2 to 6 carbons, aryl and nuclear substituted derivatives thereof in which the substituents are selected from the group consisting of halogen, nitro and lower alkyl, R_2 is a radical selected from the group consisting of alkyl having from 1 to 10 carbon atoms; haloalkyl having from 1 to 10 carbon atoms; alkenyl having from 2 to 4 carbon atoms; and $—NHR_3$ in which R_3 is a radical selected from the group consisting of alkyl having from 1 to 10 carbon atoms; haloalkyl having from 1 to 10 carbon atoms; aryl and nuclear substituted derivatives thereof in which said substituents are selected from the group consisting of halogen, nitro and lower alkyl; alkenyl having from 2 to 6 carbon atoms; and

in which R_4 is a member selected from the group consisting of alkyl having from 1 to 12 carbon atoms and haloalkyl having from 1 to 4 carbon atoms.

3,660,581

THERMALLY DEVELOPABLE DIAZOTYPE PRINTING PAPER AND COMPOSITION THEREFOR

Robert M. Levy, Kalamazoo, Mich., assignor to Allied Paper Incorporated, Kalamazoo, Mich.

No Drawing. Filed Apr. 23, 1969, Ser. No. 818,824

Int. Cl. C03c *1/60, 1/58*

U.S. Cl. 96—91 7 Claims

Diazo compositions containing critical proportions of dicyandiamide and thiourea as the thermal developing agents together with alkali acid sulfate stabilizer compounds, for use in forming thermally developable photo diazo printing paper are disclosed. These diazo printing papers are characterized by good image density, long shelf-life and good chemical stability.

3,660,582

PRODUCTION OF FLAME-RETARDANT SPUN-FORMED MATERIAL

Joseph DiPietro, Alma, and John Heaton Todd, St. Louis, Mich., assignors to Michigan Chemical Corporation, St. Louis, Mich.

No Drawing. Filed Mar. 27, 1969, Ser. No. 811,216

Int. Cl. C09k *3/28;* D06m *13/26*

U.S. Cl. 117—136 4 Claims

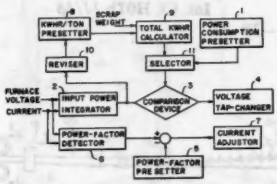
Spun-formed material such as spun-bonded polyester non-woven fabric is rendered flame retardant or self-extinguishing by treatment with an aqueous solution of a water soluble polyhaloalkyl ester of phosphoric acid in which the halogen is bromine or chlorine, and in which the alkyl radical contains two through six carbon atoms; for example, the ammonium salt of bis (2,3-di-bromopropyl) phosphate. If the phosphate ester is not sufficiently water soluble and does not readily form water soluble salts, an aqueous emulsion can be used; for example, an oil in water emulsion of tris (2,3-dibromopropyl) phosphate.

3,660,583

AUTOMATIC RAPID MELTING SYSTEM AND ITS APPLICATION FOR ARC FURNACE

Haruo Takanasi, Kasugai; Sadaie Sone, Kuwana, and Isamu Eguchi, Nagoya, all of Japan, assignors to Daido Seiko Kabushiki Kaisha, Minami-ku, Nagoya-shi, Ai hi-ken, Japan

Filed Mar. 17, 1970, Ser. No. 20,248
Claims priority, application Japan, Mar. 17, 1969, 44/20175
Int. Cl. F27b *11/10*
U.S. Cl. 13—12 1 Claim



An electric power supply program is set for controlling a steel making arc furnace. According to this program, a steel melting period is divided into a plurality of successive melting sections in each of which a predetermined total of electric power is to be supplied to the arc furnace at an optimum power level. The electric power which is actually consumed is integrated during each of said melting sections. Power level is switched from the optimum power level programed for one of said melting sections to that programed for the next section when the amount of electric power consumption actually integrated in said one melting section becomes equal to the predetermined total of electric power programed for said one melting section, thereby a melting electric power is supplied to the arc furnace at the optimum power level programed for said next melting section. A power factor program is also set. According to this power factor program, a melting electric power is to be supplied to the arc furnace with a predetermined power factor to provide an optimum length of arc for each of said melting sections. The power factor is maintained at the predetermined optimum value for each of said melting sections by controlling the current into the arc furnace by use of the deviation of the actual power factor from the power factor programed for the section. Moreover, the total electric power Y which is necessary in melting the charge of steel material is tentatively determined. First electric power Y_1 which is consumed for each of a plurality of definite, ever increasing periods from the beginning of melting operation is determined and second electric power Y_1 per unit time consumed just before the end of each of said definite periods is determined. The value X of remaining period of time which is expected to be taken before the termination of the melting operation is estimated from the following equation, $X = (y - Y_1)/Y_1$, and the value of X is indicated at every estimation to inform the operator of the remaining period of time from the end of each of said definite periods to the termination of the melting operation.

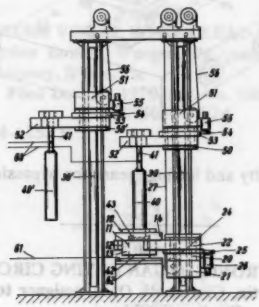
3,660,584

HOLDING MEANS FOR ELECTRODES, MOLDS, BASE PLATES AND THE LIKE IN AN ELECTROSLAG REMELTING INSTALLATION

Wolfgang Holzgruber, and Otmar Kleinhagauer, both of Kapfenberg, Austria, assignors to Gebr. Boehler & Co., Kapfenberg, Austria

Filed June 15, 1970, Ser. No. 46,439
Claims priority, application Austria, June 17, 1969, A5710/69
Int. Cl. H05b *3/60*; B22d *27/02*; H05b *7/12*
U.S. Cl. 13—14 3 Claims

In an installation for electroslag remelting of metals and, in particular, steel, a rigid and fixedly mounted column on which holding means is slidably vertically mounted. The vertical movement of the holding means along the column is controlled by a cable and winch arrangement mounted on



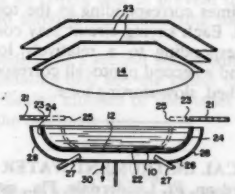
the column. The holding means comprise a guide member slidably mounted on the column and clamping means operatively mounted on the guide member.

3,660,585

FROZEN SHELL METAL MELTING MEANS

Robert D. Waldron, 5620 N. 69th Place, Paradise Valley, Ariz.

Continuation-in-part of application Ser. No. 733,719, May 31, 1968, now abandoned. This application June 24, 1970, Ser. No. 49,332
Int. Cl. H05b *3/66*
U.S. Cl. 13—25 14 Claims



A frozen shell metal melting means comprising a crucible which is substantially shallow in depth compared to its relatively greater horizontal dimension and heating means disposed above said crucible adapted to melt metal therein; and means at the bottom of said crucible to permit radiation of heat therefrom in sufficient amount to maintain a frozen shell of metal in contact with the bottom of said crucible.

3,660,586

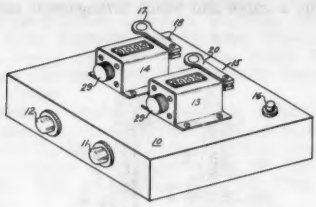
TEACHING AND TESTING APPARATUS

Bertram J. Hilbert, 1826 Chew St., Allentown, Pa.

Filed Aug. 3, 1970, Ser. No. 60,344
Int. Cl. GO9b *5/00*
U.S. Cl. 35—48 R 6 Claims

Apparatus for aiding in teaching and/or testing wherein means is provided for operation by the instructor for reward-

ing or penalizing for a correct or incorrect response, respectively, and counting said responses simultaneously with said



reward or penalty and having means for bypassing the counting means.

3,660,587

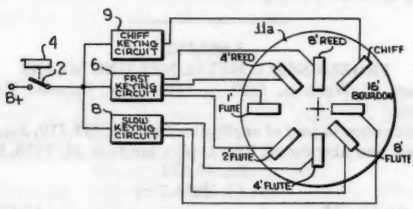
ELECTRONIC ORGAN KEYING CIRCUITS

Daniel W. Martin, Cincinnati, Ohio, assignor to D. H. Baldwin Company, Cincinnati, Ohio

Filed Mar. 23, 1970, Ser. No. 21,811

Int. Cl. G10h *3/06*

U.S. Cl. 84—1.18 **4 Claims**



In a keyed-photocell type electronic organ, two or more photocells are keyed with a single, make-brake switch via two or more respective RC keying circuits having onset and/or decay times corresponding to the tone colors and/or pitches desired. Each keying circuit may control both a first photocell corresponding to a relatively low-pitched, fast-starting tone and a second photocell corresponding to a relatively high-pitched, slow-starting tone.

3,660,588

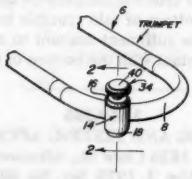
MUSICAL INSTRUMENT WATER VALVE

Jesse L. Richardson, Ft. Lauderdale, Fla., assignor to Federal Operating Co.

Filed May 22, 1969, Ser. No. 826,830

Int. Cl. G10d *7/10*

U.S. Cl. 84—397 **8 Claims**



A simplified two-part needle-type valve for use in lieu of the spring-biased lever-type water key now on all brass wind instruments such as, for example, trumpets, cornets, trombones, alto and baritone horns and the like. Both parts can be manufactured on automatic screw machines. The exteriorly recessed ported body can be soft-soldered to the instrument slide or tubing in communication with the customary water (saliva) eliminating orifice. To operate, merely turn the finger-grip and either open or close the conical valve at will.

3,660,589

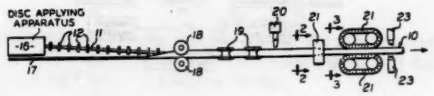
WATERTIGHT DISC COAXIAL CABLE

Ludwik Jachimowicz, Elizabeth, and Jerzy A. Olszewski, Bayonne, both of N.J., assignors to General Cable Corporation, New York, N.Y.

Filed Sept. 29, 1969, Ser. No. 861,792

Int. Cl. H01b *11/18*

U.S. Cl. 174—28 **7 Claims**



A coaxial cable consists of a plurality of discs of a dielectric synthetic resin material that bonds to metal bonded to an elongated metal center conductor respectively at spaced intervals therealong. A tubular metal outer conductor encloses the discs and is bonded thereto so that the discs define a plurality of separate watertight compartments. An inner tubular sheath of a synthetic resin may be between, and bonded respectively to, the inside of the outer conductor and the discs. Also, a layer of synthetic resin may be bonded around the exterior of the outer tubular conductor.

3,660,590

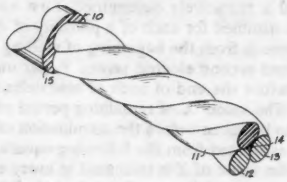
ELECTRO-OPTICAL FLUIDIC TRANSFER CONDUIT

James E. Conant, 710 Peachtree St. N.E., Atlanta, Ga.

Filed Nov. 23, 1970, Ser. No. 91,622

Int. Cl. F16l *11/12;* **H01b** *7/00;* **G02b** *5/16*

U.S. Cl. 174—47 **6 Claims**



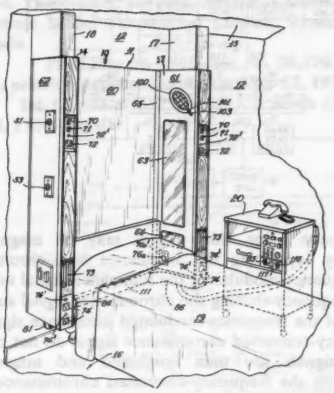
A transfer conduit capable of transmitting one or a combination of energy signals of varying characteristics. The transfer conduit is constructed of a series of filaments which are uniformly twisted along the length thereof in close contacting relationship to define therebetween an axially fluid flow passageway. The term "twisted" is meant to include braiding, entwining, or the like. A coating of impervious material is provided around the outer exposed surface of the twisted filaments for sealing the same against leakage and for securing the lengths of the twisted filaments in the twisted state. Certain of the filaments are constructed of a material which is capable of transmitting light signals therethrough. Certain other of the filaments are constructed of a material capable of transmitting electrical signals therethrough. The fluid flow passageway defined between the twisted filaments is capable of transmitting a fluid signal.

3,660,591

HOSPITAL IN-PATIENT SERVICE CORE MODULE

John R. Schultz; John W. Heidacher; John M. Sharer; James S. Adams, all of Batesville, Ind., and Frank M. Damico, Cincinnati, Ohio, assignors to Hill Rom Company, Inc., Batesville, Ind.

Filed Oct. 26, 1970, Ser. No. 83,762
Int. Cl. A47b *83/00*; A61g *7/06*
U.S. Cl. 174—70 R 21 Claims



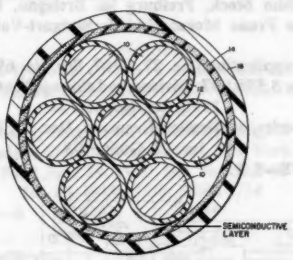
A factory constructed, equipped with electrical and gas equipment, wired, tested and enclosed patient care core module arranged to be mounted upon the headwall of a patient's room in a hospital. The mounting of the module is simply accomplished and after the module is secured on the wall, the electric and gas supply leads are connected externally of the enclosure to complete the installation.

3,660,592

ANTI-CORONA ELECTRICAL CONDUCTOR

Robert W. Anderson, Burlington, Vt., assignor to Haveg Industries, Inc., Wilmington, Del.

Continuation-in-part of application Ser. No. 795,399, Jan. 9, 1969, now abandoned, which is a continuation-in-part of application Ser. No. 587,531, Oct. 18, 1966, now abandoned. This application Feb. 27, 1970, Ser. No. 14,988
Int. Cl. H01b *7/18*
U.S. Cl. 174—114 R 16 Claims



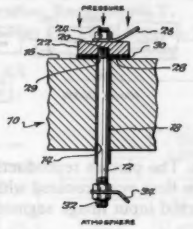
An electrical conductor assembly made up of a plurality of electrical conductor strands connected in electrical parallel each of which is provided with a continuous uninterrupted layer of insulation material. The plurality of the insulated electrical conductor strands are encompassed in an electrical conductive layer which is a fluorocarbon resin having randomly dispersed therein an electrical conductor material such as graphite in discrete particulate form. The graphite is present in amounts of 0.5 to 75 percent based on the weight of the fluorocarbon resin. This electrical conductive layer is floating with respect to ground. Alternatively, the conductive layer is grounded at relatively higher voltages. Surrounding this electrical conductive layer is an insulating support coating.

3,660,593

PRESSURE VESSEL POWER LEAD-THROUGH

Arnold Gordon Bowles, Warren, Pa., assignor to National Forge Company, Irvine, Pa.

Filed Dec. 22, 1970, Ser. No. 100,652
Int. Cl. H01b *17/26*
U.S. Cl. 174—152 R 4 Claims



An electrode for use in supplying power to equipment within a sealed vessel capable of containing fluid under pressure wherein an electrically conductive rod encased in an insulating material passes through the vessel wall to the interior of the vessel and has a boss member fitted upon its interior end. The boss member bears the outward load caused by the pressurized fluid and is supported by the inner surface of the vessel wall. The boss member is electrically insulated from the vessel wall by an insulating disc. The boss is made of conducting material and has an electrical terminal affixed to it. The boss member is substantially larger in cross-sectional area than the cross-sectional area of the conducting rod. Concentric with the disc and between the vessel wall and the boss member is an O-ring seal to prevent the escape of the pressurized fluid through the conducting rod passage in the vessel wall.

In some embodiments a second boss member is interposed between the insulating disc and the vessel wall inner surface to prevent any flexing motions of the vessel wall from being transmitted to the insulating disc.

3,660,594

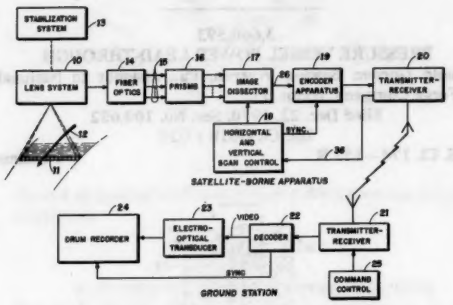
LINE-SCAN TELEVISION SYSTEM EMPLOYING SPECTRUM ANALYSIS

Lawrence B. Marsh, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Mar. 14, 1969, Ser. No. 807,228
Int. Cl. H04n *9/04*, *9/06*
U.S. Cl. 178—5.2 R 17 Claims

A line-scan television system adapted to be mounted aboard a satellite or similar vehicle for televising an object, such as the Earth or some other heavenly body, as the satellite orbits. A lens system views an elongated image swath perpendicular to the sub-orbital track and produces an elongated slit of light which, in turn, is divided into parallel image segments by suitable fiber optics. A plurality of prisms then spectrally disperse each of the image segments onto the photosensitive input surface of a suitable camera tube, such as an image dissector. This input image raster is then electronically scanned to generate corresponding output video information which is transmitted to a ground receiving station for image reproduction purposes. Scan control circuitry associated with the camera tube enables the spectrally

dispersed image segments to be scanned to provide either a variable contrast control for black and white reception, as selected by a remote command signal, or to permit full-color

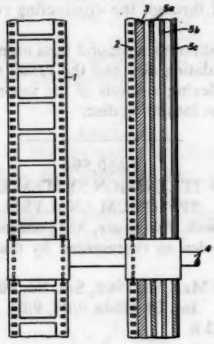


television reception. The picture reproduction equipment at the ground station is time synchronized with the scanning of the spectrally dispersed input image segments at the camera tube.

3,660,595
METHOD AND SYSTEM FOR CORRECTING COLOR ERRORS IN COLOR FILM DURING TELEVISION TRANSMISSION

Burkart Brembach; Alfred Eisinger; Hans Horneff, and Heinrich Zahn, all of Darmstadt, Germany, assignors to Fernseh GmbH, Darmstadt, Germany

Filed Aug. 4, 1969, Ser. No. 848,768
Claims priority, application Germany, Aug. 8, 1968, P 17 62 714.4
Int. Cl. H04n *5/48, 9/53*
U.S. Cl. 178—5.2 A **13 Claims**

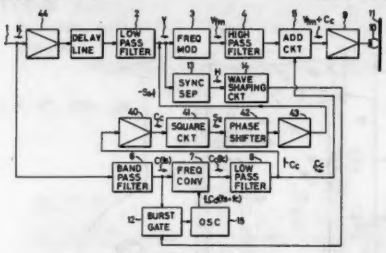


Correction signals for correcting color errors are entered onto elongated signal carrier means moving synchronously with a color film, by an operator during viewing of the film prior to transmission. During transmission the correction signals are derived from the elongated signal carrier means and applied to the color matching units normally present. Each of these units affects the transmission of a particular color signal in response to the correction signals. The amplitudes of the color signals may be decreased, and further the contrast and black level may also be corrected.

3,660,596
RECORDING AND REPRODUCING SYSTEM FOR COLOR VIDEO SIGNAL

Toshihiko Numakura, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 15, 1970, Ser. No. 37,692
Claims priority, application Japan, Jan. 26, 1970, 45/6857
Int. Cl. H04n *1/22*
U.S. Cl. 178—5.2 **14 Claims**

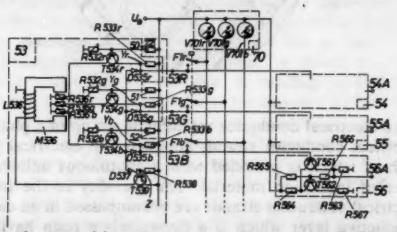


A composite color video signal may be magnetically recorded by separating the luminance and chrominance signals, frequency-modulating the luminance signal on a carrier, and frequency-shifting the chrominance signal such that the bands of the frequency-modulated luminance signal and the frequency-converted chrominance signal do not overlap. The two signals are then combined and magnetically recorded with the frequency-converted chrominance signal amplitude modulating the frequency-modulated luminance signal. To avoid a beat interference between a harmonic, particularly the second harmonic of the carrier of the frequency-converted chrominance signal and the luminance signal, there is provided a compensation signal which is an integral multiple of the frequency of the carrier of the frequency-converted chrominance signal, and which is phase-shifted with respect to said carrier so that, when the compensation signal is added to the luminance signal either before frequency-modulation in the recording operation, or after demodulation of the frequency-modulated luminance signal in the reproducing operation, the described beat interference is avoided. By avoiding the beat interference the amplitude of the frequency-converted chrominance signal relative to the amplitude of the frequency-modulated luminance signal, as recorded, can be made large with resulting good signal-to-noise ratio of the reproduced chrominance signal.

3,660,597
METHOD AND APPARATUS FOR SCANNING AND SENSING COLORED PATTERNS

Hans Joachim Stock, Freiburg im Breisgau, Germany, assignor to Franz Morat GmbH, Stutgart-Vaihingen, Germany

Original application Dec. 27, 1967, Ser. No. 694,032, now Patent No. 3,578,897. Divided and this application Nov. 12, 1970, Ser. No. 88,724
Claims priority, application Germany, Dec. 27, 1966, 7218725
Int. Cl. G03f *3/08*
U.S. Cl. 178—5.2 A **15 Claims**



Three photosensitive elements, such as photodiodes, one for each of the colors red, green and blue, scan, point-by-

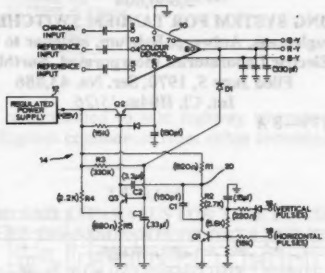
point, and sense the colors of a pattern. The voltages corresponding to the three colors are so amplified substantially an equal amount that the voltage corresponding to the brightest of the colors is raised to a fixed value of that is independent of the color brightness.

3,660,598

DC REGULATING BLANKING INSERTION CIRCUIT AND COLOR MATRIX CIRCUIT

Sotos M. Theodoulou, Toronto, Ontario, Canada, assignor to Clairtone Sound Corporation Limited, Rexdale, Ontario, Canada

Filed May 18, 1970, Ser. No. 38,376
Claims priority, application Canada, May 12, 1970, 082,511
Int. Cl. H04n 9/50; H03b 3/02; H04b 1/16
U.S. Cl. 178—5.4 SD **11 Claims**



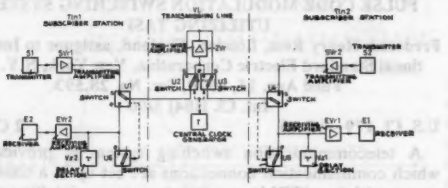
In a color television set, blanking pulses are superimposed on the supply voltage to the color demodulator, resulting in blanking pulses at the color difference outputs. The DC level at the tips of the blanking pulses at the outputs is detected and used to control the supply voltage, to regulate the quiescent DC level at the outputs to a known value. The color demodulator outputs feed drive amplifiers connected to the electron guns of the set. Adjustable tracking resistors feed the Y signal to the drive amplifiers, and since the potentials in the drive amplifiers are accurately known when no signal is present (because of the regulated bias supplied from the color demodulator), a service switch is provided to establish a reference potential which in effect cancels the effects of the tracking resistors when the guns are to be adjusted for coincident cutoff. Hence the guns can be adjusted for coincident cutoff with the tracking resistors rendered ineffective, and then the reference potential is removed and the tracking resistors are adjusted for grey tracking, the two adjustments having no effect on each other.

3,660,599

METHOD OF AND CIRCUIT ARRANGEMENT FOR PICTURE TRANSMISSION USING MULTIPLEX TECHNIQUES

Heinz Wiedmann, Moglingen, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed June 29, 1970, Ser. No. 50,748
Int. Cl. H03n 7/08; H04n 7/14
U.S. Cl. 178—6 **2 Claims**



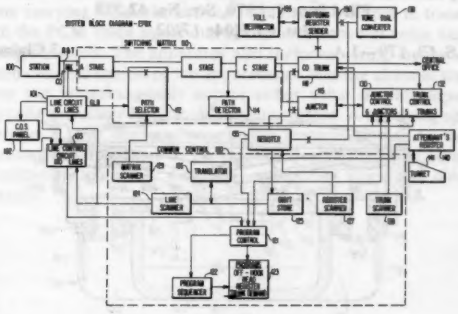
The method and circuit arrangement for transmitting video pictures over a telephone line using time division multiplex techniques. Signals are sent in both directions on the line, and the transmitted signals are stored in a delay section at the receiving end until a full picture has been received. Each picture is divided into two partial pictures or images, each capable of transmission within a discrete pulse or time slot. The partial picture received during one time slot is stored until the second partial picture is received during a subsequent time slot, thereby completing the picture. The complete picture may then be released from the receiving end to suitable picture processing or display equipment.

3,660,600

PATH FINDING SYSTEM FOR MULTI-STAGE SWITCHING MATRIX

Ernest O. Lee, Jr., Fairport, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed May 15, 1970, Ser. No. 37,772
Int. Cl. H04q 3/54
U.S. Cl. 179—18 EA **30 Claims**



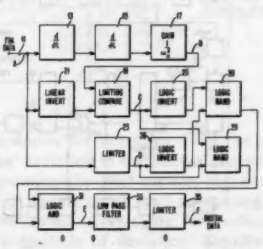
System for obtaining a free path through a multi-stage switching matrix from a marked input to one of a plurality of junctors or trunks at an output of the network wherein scanning is provided at the outputs of the first stage switch which includes the marked input, the inputs of all third stage switches are monitored to detect the scanning signals on available lines, and the availability of the required junctors or trunks is then correlated to the monitored information at the third stage inputs so as to simultaneously allot a junctor or trunk and select a free path connectable thereto.

3,660,601

FREQUENCY DETECTION SYSTEM

Donald R. Dobson, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 10, 1970, Ser. No. 44,960
Int. Cl. H04l 15/24
U.S. Cl. 178—88 **7 Claims**



A system for detecting frequency shift keying information on a real time basis independent of the amplitude of the

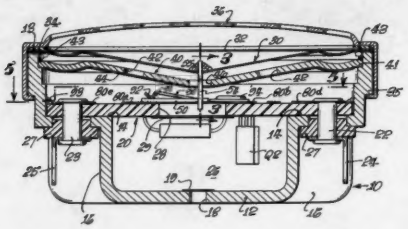
input FSK signal. The second derivative of the input voltage waveform signal which is in exact phase with the input signal is obtained. The gain of the differentiated voltage signal is controlled so that when the input signal has a frequency below predetermined frequency, the magnitude o2 the differentiated voltage signal will be less than the magnitude of the input voltage signal at all points except zero; and when the input signal exceeds the predetermined frequency, the magnitude of the differentiated voltage signal exceeds that of the input voltage signal. The input signal and the gain controlled differentiated signal are magnitude compared and an output signal representative of the result of the comparison and hence of the frequency of the input signal is supplied. A low pass filter introducing minimal signal delay is utilized to remove possible logic silvers at the time when both signals are zero and when there is an input frequency change.

3,660,602

MICROPHONE CARTRIDGE WITH AMPLIFIER

Paul Thompson, Cedar Rapids, Iowa, assignor to Conrac Corporation, New York, N.Y.

Filed June 1, 1970, Ser. No. 42,378
Int. Cl. H04c *17/02*
U.S. Cl. 179—1 A **3 Claims**



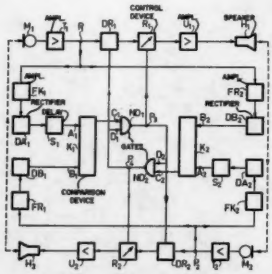
The microphone of the invention obtains damping from a perforated baffle closely adjacent the diaphragm with fabric covering the perforations, and from resistive structures behind the baffle. The piezoelectric transducer element is mounted directly on a circuit board which also carries all electronic components of a preamplifier circuit.

3,660,603

SPEECH-CONTROLLED BILATERAL AMPLIFIER

Bjorn Andersen, Oslo, Norway, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 28, 1969, Ser. No. 853,881
Claims priority, application Norway, Aug. 29, 1968, 3369/68
Int. Cl. H03g *3/24*
U.S. Cl. 179—1 VC **9 Claims**



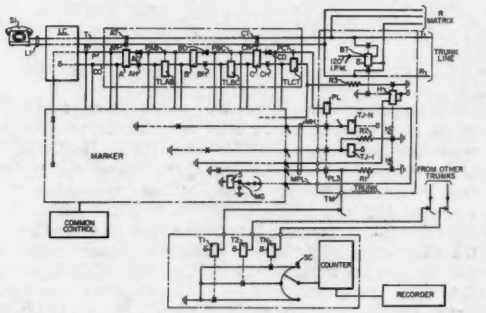
A speech-controlled bidirectional amplifier that includes first and second transmission channels each with a control member controlled by speech signals derived at control points preceding the control member. First and second comparison devices responsive to the levels of the speech signals control a third comparison device that in turn controls the attenuation level of the control members. The amplifier is arranged so that in the rest condition both control members provide a high signal attenuation. When speech signals are transmitted through one channel, the other channel is cut-off. However, an interrupt facility is provided whereby a speech signal above a given level in the cut-off channel will cause the apparatus to switch over so that the cut-off channel is opened and the previously open channel is then cut-off.

3,660,604

METERING SYSTEM FOR TANDEM SWITCHED CALLS

Lucas Bruglemans, Antwerp, Belgium, assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed June 5, 1970, Ser. No. 43,886
Int. Cl. H04m *15/26*
U.S. Cl. 179—8 A **4 Claims**



A crosspoint switching exchange includes a metering scheme for selectively metering traffic through trunk circuits used to access a plurality of exchanges via a tandem exchange. The trunk circuit includes a pair of contact sets, one set operated during the interval of pulling up the crosspoint matrix path to the trunk circuit and the other set operated by the path hold relay. These contacts respectively operate and hold a metering relay in the metering equipment which then has only to scan this relay to determine the total usage for a particular exchange via this trunk group of circuits.

3,660,605

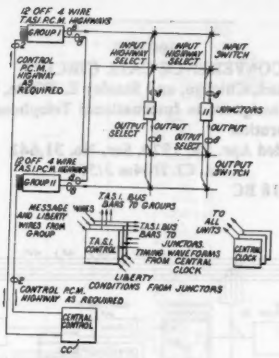
PULSE CODE MODULATION SWITCHING SYSTEM UTILIZING TASI

Frederick Henry Rees, London, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 15, 1970, Ser. No. 28,593
Int. Cl. H04j *5/00*
U.S. Cl. 179—15 AS **2 Claims**

A telecommunication switching system is provided in which communication connections are set up in a time division multiplex (TDM) manner to convey intelligence by pulse code modulation (PCM). The system utilizes time assigned signal interpolation (TASI) techniques so that during

a silent period in a communication connection the communicatees can be disconnected from the multiplex highway,



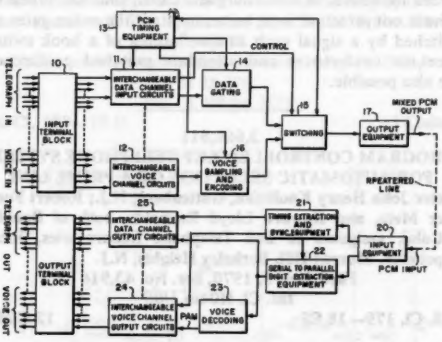
and can be re-connected to said highway whenever a new burst of intelligence commences from either communicatee.

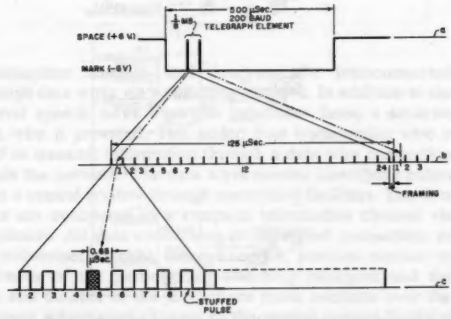
3,660,606

METHOD AND APPARATUS FOR TIME DIVISION MULTIPLEX TRANSMISSION OF DATA AND VOICE SIGNALS

Russell G. De Witt, Berkeley Heights, N.J., assignor to The Western Union Telegraph Company, New York, N.Y.

Filed Apr. 28, 1970, Ser. No. 32,616
Int. Cl. H04j *3/16*
U.S. Cl. 179—15 BA **12 Claims**





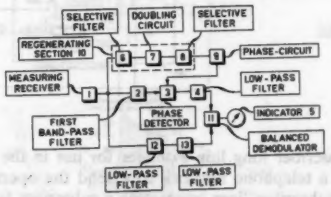
Disclosed is a method for TDM transmission of binary data signals, such as telegraph signals, including the steps of: sampling the data signals at a rate to provide a plurality of samples such as 5 to 40 samples over the time interval associated with each digit of the binary data signals, serially coding the samples to provide a TDM signal representing the sampled data signals, and transmitting the serially coded TDM signal over a transmission medium. Also disclosed is a preferred apparatus for transmitting a variable number of data and voice signals which includes a crystal oscillator for providing a 1.544 megabit timing signal, a digit generator, a channel counter providing a channel count for every eight digits and providing 24 channel counts as the transmission format, interchangeably removable voice and data input circuits for occupying the channels of transmission with either voice or data inputs, wherein the data input circuits include sampling gates for transmitting a plurality of samples of the data signals so that the transmission digit rate is essentially independent of the digit rate of the input data signals. The voice input circuits include conditioning and wiring provisions to be interchangeable with the data input circuits. Also included are voice encoding means to provide a voice output PCM signal, and switching means for switching the output to transmit the serially coded TDM signal during the occurrence of data carrying channels, and for switching the output to transmit the PCM voice signal during the occurrence of voice carrying channels. The apparatus also includes wiring means to each channel station of the apparatus so that the channel station can interchangeably accept either voice or data input circuits to occupy its channel of transmission. A receiving apparatus is also disclosed employing features similar to the transmitting apparatus to provide for flexible two-way communication to handle a variable number of voice and data signals.

3,660,607

APPARATUS AND METHOD FOR DETECTING PHASE DEVIATION OF A PILOT SUBCARRIER IN STEREOPHONIC MULTIPLEX BROADCASTING

Zdenek Mack, Prague, Czechoslovakia, assignor to TESLA, narodni podnik

Filed Apr. 1, 1970, Ser. No. 24,648
Claims priority, application Czechoslovakia, May 16, 1969, 3486-69
Int. Cl. H04h *5/00*
U.S. Cl. 179—15 BT **7 Claims**

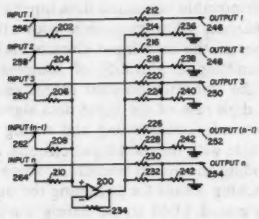


Method and apparatus for detecting both the magnitude and direction of any deviation in the pilot-subcarrier wave by conventionally separating the pilot carrier, regenerating and shifting its resultant signal by 90° and comparing it with a signal derived from the multiplex signal to produce a signal indicative of the magnitude of deviation. Simultaneously a reference signal is obtained from the original multiplex signal which is in phase with the comparison signal. The deviation signal and the reference signal are then demodulated to produce a directional voltage.

3,660,608
MEANS FOR REDUCING CROSS TALK IN MULTIPLEXED CIRCUITRY

Charles R. Moose, Jr., Canoga Park, Calif., and James L. Jenkins, Baltimore, Md., assignors to The Bunker-Ramo Corporation, Canoga Park, Calif.

Filed Nov. 29, 1968, Ser. No. 779,726
Int. Cl. H04j 3/10
U.S. Cl. 179—15 AN 21 Claims

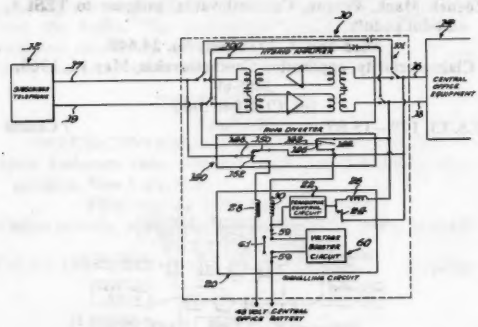


A means for eliminating cross talk between multiplexed communication channels when such channels use a common phase-shifted "pseudo-random noise" sequence as a carrier. The cross talk is canceled, in each channel, by adding (or subtracting) a weighted sum of signals in all channels to the signal in that channel, either at the transmitting station or at the receiving station.

3,660,609
SUBSCRIBER LONG LINE EXTENDER

Hubert J. Tremblay, Roselle, and Frank V. Mellen, Jr., Lombard, both of Ill., assignors to Communications Systems Corporation, Morton Grove, Ill.

Filed Aug. 22, 1969, Ser. No. 852,203
Int. Cl. H04m 1/76; H04g 1/30
U.S. Cl. 179—16 F 13 Claims



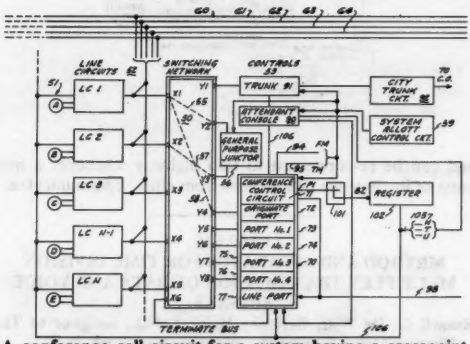
A subscriber long line extender for use in the subscriber loop of a telephone network to extend the operating limits for the subscriber lines connecting a subscriber telephone to the central office equipment and the central office voltage source comprising a signalling circuit which is operably connected to brake the subscriber line and further operable in response to the current generated by the subscriber telephone being placed in an off-hook condition to provide closed circuit to the central office equipment indicative of the off-hook condition of the subscriber telephone and independent of any impedance in the subscriber loop.

A second auxiliary feature of the subscriber long line extender provides for a hybrid amplifier to be used in conjunction with the above signalling circuit to enable simultaneous two-way transmissions between the subscriber telephone and the central office equipment, and an isolating means connected between the hybrid amplifier and the signalling circuit to prevent interaction between the signalling and amplification functions.

3,660,610
CONFERENCE CALL CIRCUIT

Alfred M. Hestad, Chicago, and Stanley E. White, Crestwood, both of Ill., assignors to International Telephone and Telegraph Corporation

Filed Apr. 24, 1970, Ser. No. 31,641
Int. Cl. H04m 3/56
U.S. Cl. 179—18 BC 7 Claims

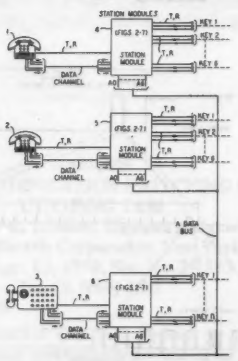


A conference call circuit for a system having a crosspoint switching network of the end-marking type. The circuit allows a private conversation to be held between the calling station and a called station in a "progressive" conference through the use of a voice gate within a conference access circuit individual to the calling and called stations. When the private conversation is to be terminated, the voice gates are switched by a signal such as the flashing of a hook switch. Meet-me conferences and attendant switched conferences are also possible.

3,660,611
PROGRAM CONTROLLED KEY TELEPHONE SYSTEM FOR AUTOMATIC SELECTION OF A PRIME LINE

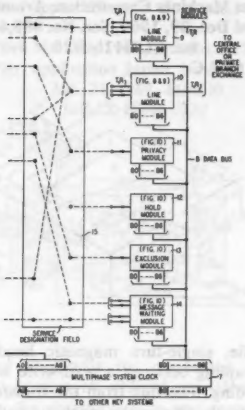
Dieter John Henry Knollman, Guttenberg, N.J.; Robert Forcier Metz, and Howard Lloyd Reynolds, both of Boulder, Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed June 5, 1970, Ser. No. 43,916
Int. Cl. H04m 1/00
U.S. Cl. 179—18 ES 12 Claims



A program controlled key telephone system which includes line modules and station modules for providing the interface

circuitry between PBX/CO lines and stations is disclosed. System functions are controlled by a multiphase clock which generates a reiterative list of binary coded signals based on a



master program. The system is arranged to control the connection of a prime line or previously connected line to each station set going off-hook without depressing a key.

3,660,612

COMMON CONTROL TELEPHONE SWITCHING SYSTEM EMPLOYING ADDED DATA WIRE

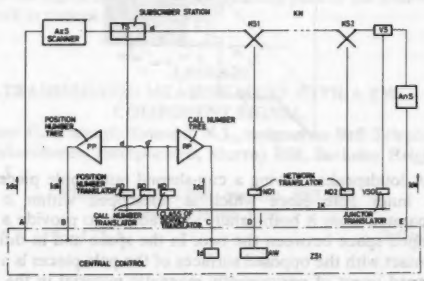
Heinz Schluter, Kornwestheim, and Hilmar Schonemeyer, Stuttgart, both of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Continuation of application Ser. No. 635,873, May 3, 1967, now abandoned. This application June 29, 1970, Ser. No. 56,088

Claims priority, application Germany, May 11, 1966, St 25 370

Int. Cl. H04m *3/38*

U.S. Cl. 179—18 D **3 Claims**



Subscriber circuits and junctors are interconnected through data wires via a switching network. In addition to the normal speech wires from the subscriber lines, a separate data wire is provided. This added data transmission wire is used to transmit information through a data wire connection within the network. The data wires receive identifying pulses from a central control through connecting facilities. The data wires are connected to a common information channel via translators. All data concerning an identified connection, as e.g. subscriber number, class-of-service, position number or addresses of the participating switching multiples and the type and number of the junctor are made available over the common information channel to the central control facilities for evaluation.

3,660,613

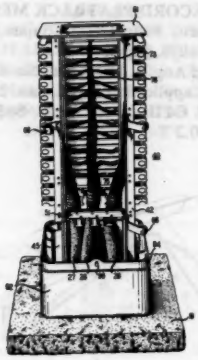
SERVING AREA CONNECTOR

Francis Joseph Mullin, Baltimore, and Raymond Bolton Ramsey, Towson, both of Md., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 21, 1971, Ser. No. 108,360

Int. Cl. H04q *1/00*

U.S. Cl. 179—98 **7 Claims**



This disclosure describes multipair telephone cable connection apparatus for cross-connecting between a large number of pairs from a feeder cable to pairs of distribution cables. The connector typically is used in above-ground exchange area locations, operating in a system in which it is the only necessary interconnection point for about 500 subscribers. The closure is characterized by a square cross section, three vertical working faces, and an open side. Two of the working faces, opposite each other, mount quick-connect blocks to which distribution pairs are permanently terminated. The third face uses similar connector blocks to terminate pairs from the feeder cable. All cables enter through the closure base and pass through its interior. Jumpers are affected only on the exterior faces, and are arranged easily without becoming unmanageable.

3,660,614

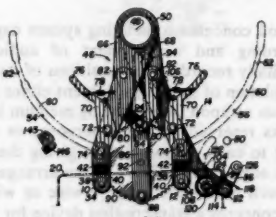
DRIVE FOR TAPE GUIDES OF TAPE TRANSPORT

William W. Swain, Mountain View, and Richard A. Hathaway, Saratoga, both of Calif., assignors to Cartridge Television, Inc., New York, N.Y.

Filed June 26, 1970, Ser. No. 50,245

Int. Cl. G11b *5/52, 23/08*

U.S. Cl. 179—100.2 T **20 Claims**



Apparatus for moving a pair of tape guides of a tape transport of the type having a rotary head assembly. The guides are adapted to be received within a tape cartridge positioned adjacent to the rotary head assembly and to pull a stretch of tape out of the cartridge and about a portion of the arcuate

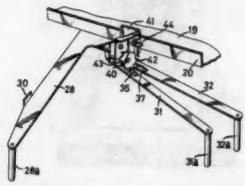
path of travel of the heads of the assembly. The apparatus includes a pair of arms having drag links pivotally mounted thereon which mount the tape guides. Each drag link has means thereon for properly positioning the same relative to the head path each time the drag link moves its tape guide into an operative position.

3,660,615

TAPE LOOP FORMING MECHANISM FOR USE WITH A TAPE RECORD/PLAYBACK MECHANISM

Yuuichi Kanamaru, Saitama-ken, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 6, 1970, Ser. No. 61,618
Claims priority, application Japan, Jan. 24, 1970, 45/6484
Int. Cl. G11b *15/60, 15/66;* **B65h** *23/26*
U.S. Cl. 179—100.2 T **10 Claims**



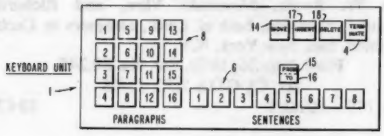
A ratchet mechanism is used to separate rotatable and longitudinally movable tape guiding fingers in a video tape recorder. The fingers withdraw the magnetic tape from a tape cassette, form it into a loop and place it around a rotating drum having magnetic tape heads therein.

3,660,616

DICTATING AND TRANSCRIBING SYSTEMS FEATURING RANDOM SENTENCE ARRANGEMENT WITH RECOGNITION AND LOCATION OF SENTENCES IN A PREFERRED SEQUENCE

Ronald V. Davidge, and Robert A. Kolpek, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 29, 1970, Ser. No. 50,577
Int. Cl. G06f *7/00;* **G11b** *27/08*
U.S. Cl. 179—100.2 MD **4 Claims**



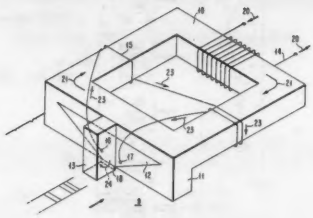
The invention concerns a dictating system capable of the random recording and arrangement of audio segments, means for digitally recording the positions of such segments after the completion of such arrangement either upon an additional medium or upon the recording medium in a separate track or tracks reserved for such purposes or in locations corresponding to each audio segment giving the location of the next audio segment as defined by the arrangement, or for transmitting such information over a wire or wireless channel; and also concerns a transcription device for use with the above system, either capable of reading such digital information into memory before the beginning of the transcription process or capable of reading information giving the location of the next audio segment as defined by the arrangement during the transcription process, and having means for accessing audio segments on the medium recorded by the above system in the order of the arrangement.

3,660,617

LOW PROFILE SINGLE-TURN MAGNETIC RECORDING HEAD WITH READ/WRITE WINDING COUPLED TO SINGLE TURN WINDING

Jacob John Hagopian, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1969, Ser. No. 888,632
Int. Cl. G11b *5/20*
U.S. Cl. 179—100.2 C **9 Claims**



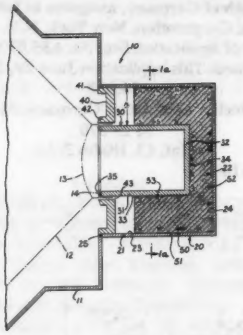
A low profile, single-turn magnetic head with integral transformer coupling between a read/write winding and the single-turn winding. The flux from the transformer action is at right angles to the flux in the magnetic path for the single turn.

3,660,618

MAGNETIC ASSEMBLY FOR LOUDSPEAKER

Stanley F. White, 466 East Vallette, Elmhurst, Ill.

Filed Oct. 1, 1970, Ser. No. 77,246
Int. Cl. H04r *9/04*
U.S. Cl. 179—115.5 R **25 Claims**

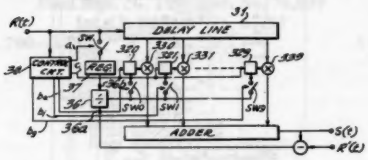


A loudspeaker having a cup-shaped outer pole piece and an inner pole piece which is telescoped within it and separated from it both axially and radially to provide a cup-shaped space between the two. In the space and in intimate contact with the opposed surfaces of the pole pieces is a cup-shaped insert of permanently magnetic material in the form of magnetic particles suspended in an inert binder. The inert binder is preferably formed of elastomeric material such as synthetic rubber or resilient plastic with a snug or slightly interfering fit so that the elements may simply be pressed together to assemble them. The permanently magnetic material is magnetized during fabrication, prior to, or following, assembly, being polarized so that the surfaces presented to the two pole pieces are of opposite polarity. The invention resides in part in the method used in assembling the parts together. In an aspect of the invention the magnetic insert is of composite construction using adjacent portions of magnetic material polarized at right angles. In another aspect of the invention the insert includes an annulus which is formed of a bar of elastomeric material bent in a circular shape incident to assembly.

3,660,619
METHOD AND APPARATUS FOR ECHO CANCELLATION IN TELEPHONE NETWORKS UTILIZING TWO-WIRE/FOUR-WIRE EQUIPMENT

Seibi Chiba, and Tadahiro Sekimoto, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Nov. 19, 1969, Ser. No. 877,887
Claims priority, application Japan, Nov. 21, 1968, 43/86006; Jan. 21, 1969, 44/4540
Int. Cl. H04b 3/20
U.S. Cl. 179—170.2 5 Claims

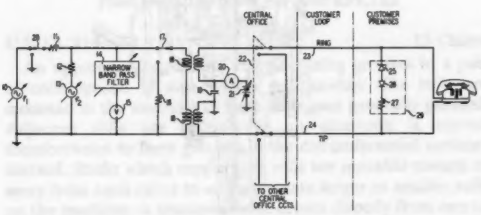


Method and apparatus for cancelling echos in two-wire/four-wire equipment utilized in telephone networks wherein, upon the detection of a non-speech interval, the signal appearing in the sending path of the four-wire circuit is divided by the signal in the receiving path of the four-wire network present at the same time to generate a transfer function. The transfer function is multiplied by the leakage signal in the sending path of the four-wire circuit to form a product. The transfer function (quotient signal) is stored after formation thereof to be utilized during succeeding equally spaced time intervals to form a transfer function during each such time interval, which succeeding transfer functions are stored in suitable registers. The signal in the receiving path is coupled to a multi-tapped delay line, wherein it is utilized to form a product with each of the transfer functions so formed and associated with each output of the multi-tapped delay line. All of the products are summed to form a resultant signal which is subtracted in a different circuit which receives the leakage signal in the sending path of the four-wire network to initially provide the signal utilized to form the transfer functions at each of the equally spaced time intervals and which is ultimately utilized to subtract the leakage signal from the signal appearing in the sending path of the four-wire circuit to cancel talkers' echo.

3,660,620
TRANSMISSION MEASUREMENT WITH A TWO-COMPONENT SIGNAL

Luther G. Schimpf, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Dec. 10, 1969, Ser. No. 883,785
Int. Cl. H04b 3/46
U.S. Cl. 179—175.3 3 Claims

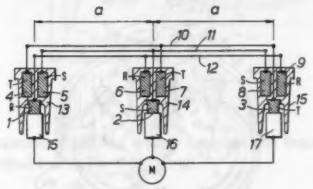


A system for measuring the transmission loss in a telephone customer's loop. A diode network is connected at the customer's premises across the loop. At the central office two alternating current signals are impressed on the loop. One signal is a low frequency, high amplitude signal used to switch the diode network alternately into its conducting and nonconducting states, thus causing the modulation of the second high frequency, low amplitude signal. The sum or the difference frequency is filtered out and measured at the central office.

3,660,621
PLANT FOR AC POWER SUPPLY TO A DEVICE MOVABLE ALONG A TRACK

Asbjorn Moen, Hasselbokken 21 A, Oslo, 7, Norway

Filed Mar. 23, 1970, Ser. No. 21,753
Claims priority, application Norway, Mar. 26, 1969, 1256/69
Int. Cl. B60m 1/00
U.S. Cl. 191—2 4 Claims



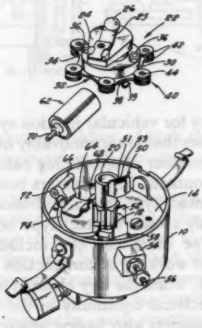
For AC power supply to a device movable along a track, such as an electrically powered crane, the invention provides a compensated conductor system for each phase by placing, close to each contact rail, additional conductors of other phases are provided extending along the track in close but insulated relation to said contact and rail electrically connected to the remaining rails of said other phases at intervals along the track, whereby voltage drops are minimized and the power factor is improved.

For each rail with adjacent conductors and appurtenant insulation, composite section units are provided.

3,660,622
DISTRIBUTOR FOR INTERNAL COMBUSTION ENGINE WITH IMPROVED ADJUSTABLE ROTOR CONTACT ASSEMBLY

Anthony A. Machado, 559 Bee Street, Meriden, Conn.

Filed Apr. 16, 1971, Ser. No. 134,713
Int. Cl. H01h 19/10
U.S. Cl. 200—19 A 9 Claims



A distributor for internal combustion engine having a rotor of a non-conducting material mounted on a grounded distributor shaft. A metal point support plate is adjustably sup-

ported on the rotor and has a plurality of rotary contact points mounted thereon. Advantageously a stationary contact is mounted on the distributor for successive engagement by the rotary contact points, the stationary point having an arcuate contact surface for rolling engagement by the rotary contact points. Metallic fasteners releasably hold the rotor on the distributor shaft and ground the plate to the shaft. The distributor has a condenser, a stationary point, and a rotor with the rotary contact points which are releasably mounted in the distributor for convenient manual replacement.

3,660,623

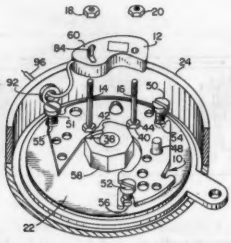
DISTRIBUTOR SENSOR ADAPTOR

Louis A. Bevacqua, Des Plaines, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed May 17, 1971, Ser. No. 143,829

Int. Cl. H01h *19/00*

U.S. Cl. 200—19 R **5 Claims**



Apparatus for connecting a sensor used in a contactless ignition system in the distributor of a vehicle including an adaptor plate with breakaway portions for fitting the plate to different types of internal combustion engine distributor housings. The timing sensor is connected to the adaptor plate in a spaced relation to the distributor cam. The adaptor plate in turn is connected to an advance plate within the distributor housing utilizing connecting means originally used to connect the breaker points to the advance plate.

3,660,624

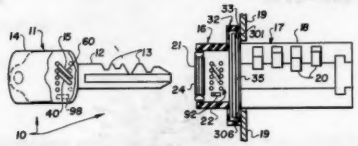
ELECTRICAL KEY FOR IGNITION SYSTEMS

George Bell, 420 Fairview Avenue, Fort Lee, N.J.

Continuation-in-part of application Ser. No. 875,334, Nov. 8, 1969. This application Feb. 12, 1970, Ser. No. 10,917

Int. Cl. E05b *17/00*; H01h *27/08*

U.S. Cl. 200—44 **2 Claims**



An electrical key for vehicular ignition systems having ignition system adapters that are irremovably interposed between a predetermined number of spark plug cable receptacles and their distributor contacts. The adapters being of two types, a normally open contact type that is activated by the electrical key and a normally closed contact type not affected by the electrical key. The electrical key including an electrical coded key element working in conjunction with an electrical coded key adapter, when the key element is inserted therein, to produce an electrical continuity in the vehicular ignition system. The key adapter also having wound-up means which will reject the key element when the key is in the "off" position while when rotated in the "on" position will be held in place to cause current to flow through the coded electrical circuitries to the spring loaded solenoid of the system adapters in starting the vehicular engine.

3,660,625

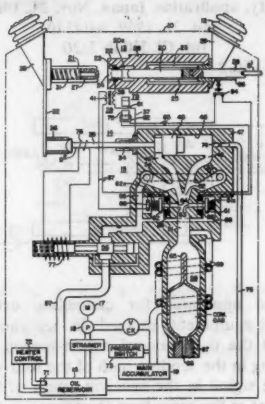
SYNCHRONOUS-TYPE CIRCUIT BREAKER HAVING TWO INDEPENDENTLY-OPERABLE MECHANISMS

Laird R. Allen, Jr., Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 23, 1970, Ser. No. 5,180

Int. Cl. F15c *3/02*; H01h *33/30*

U.S. Cl. 200—148 J **10 Claims**



A fluid amplifier is utilized to operate the secondary or synchronous contacts of a circuit breaker having main or non-synchronous contacts and secondary or synchronous contacts, which are connected in parallel-circuit relation when the breaker is closed. The operation of the fluid amplifier is controlled by repulsion coil actuated valves. The energization of the repulsion coils is so controlled by current responsive means and by a synchronous control device that the secondary contacts are opened just prior to a current zero after the opening of the main contacts of the breaker. Compressed gas stored in an accumulator supplies energy for open-reclose-open-reclose operation of the secondary contacts if necessary.

3,660,626

SEALED TYPE CURRENT INTERRUPTING DEVICE

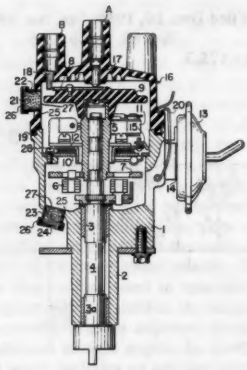
Selichi Kawamura, Hitachi; Isamu Arano, Katsuta, and Fumito Nakajima, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 20, 1970, Ser. No. 13,071

Claims priority, application Japan, July 23, 1969, 44/57690

Int. Cl. H01h *9/04*

U.S. Cl. 200—168 G **5 Claims**



A sealed type current interrupting device for vehicles comprising electrode members for making and breaking current,

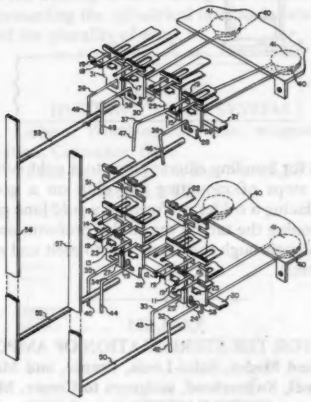
a catalyst column containing a catalyst for decomposing ozone generated between said electrode members, and a casing member for sealing said electrode members and said catalyst column, whereby said electrode members and said catalyst column are substantially isolated from the outer atmosphere.

3,660,627

ACTUATORS WITH TORSION ARMS FACILITATING PRESELECTION IN CROSSBAR SWITCHES

Clifford Edward Symes, Hanover Park, Ill., assignor to Automatic Electric Laboratories, Inc., Northlake, Ill.

Filed Sept. 30, 1970, Ser. No. 76,839
Int. Cl. H01h *67/26, 63/33*
U.S. Cl. 200—175 **4 Claims**



In typical crossbar switches, selection operators move flexible fingers to restricted areas within openings of selected operate cards, and subsequent operation of hold actuators against the fingers operate the selected cards. According to this disclosure, the ends of the flexible fingers that are to be engaged by operated selection operators are bent to function as levers that are rotated quite readily as a result of the twist of the long portions of the flexible fingers. The torsional spring characteristic provided by the levers permits the selection operators to operate fully during preselection without requiring much more than normal operating force.

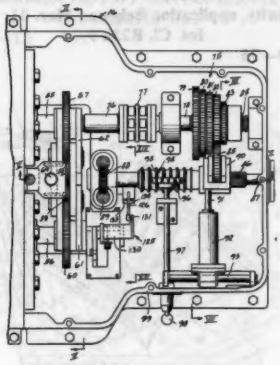
3,660,628

ELECTRIC ARC MACHINING APPARATUS FOR MANUFACTURING DIES AND ROLLS

Michael E. Celovsky, Bloomfield Hills, Mich., assignor to Industrial Tool Engineering Company, Detroit, Mich.

Filed Sept. 18, 1969, Ser. No. 859,123
Int. Cl. B23p *1/12*
U.S. Cl. 219—69 V **13 Claims**

An apparatus for electric arc machining grooves in a pair of rolls spaced in side-by-side relationship. The rolls are mounted in the machine to have their axes generally parallel. Adjacent rolls are rotated as an electrode is moved therebetween to form grooves in the circumferential surfaces thereof. Shafts which support the rolls are movable toward or away from each other to accommodate larger or smaller rolls on the machine. A transmission is driven directly from one of the movable shafts. The transmission through a gear rack arrangement moves the electrodes vertically between the rolls. By means of the transmission, the speed of movement of the electrode can be varied to accommodate different diameter rolls. The lateral movement between the rolls with respect to the fixed transmission is accommodated by means of a paral-



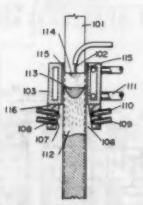
lel displacement coupling which couples the transmission to the associated roll supporting shaft.

3,660,629

METHOD AND DEVICE FOR WELDING HIGH TENSILE STRENGTH STEEL OF HIGHER STRENGTH

Tuneo Nakai, Takatsuki; Akira Ando, Takarazuka; Setuzi Minehisa, Itami; Shunsuke Kaneko, Neyagawa; Yosinori Siraki, Sakai; Tatuo Inui, Osaka; Hiroyuki Nakazima, Ashiya, and Naotugu Tominaga, Sakai, all of Japan, assignors to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka-shi, Nishi-ku, Japan

Filed Jan. 2, 1970, Ser. No. 154
Int. Cl. B23k *9/18, 25/00*
U.S. Cl. 219—73 **10 Claims**



At first to execute a welding of high tensile strength steel of more than 60 kg/mm² an electro-slag welding technique is adapted.

While said electro-slag welding being operated, deposited metal near the molten weld metal and the base metal portion near thereto in hot state are subjected to high speed cooling by liquid so that they may be quenched, thereby to transform the bond structure into a structure comprising martensite and lower bainite or preferably into a martensitic structure.

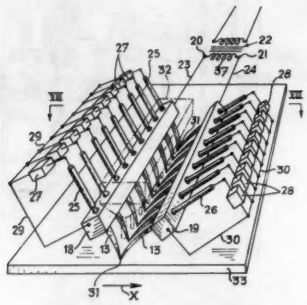
And then by tempering, said structure comprising martensite and lower bainite is changed into a structure comprising tempered martensite and tempered lower bainite and said martensitic structure is changed into a tempered martensitic structure.

3,660,630

HIGH TEMPERATURE HEATING

Jean A. F. Sunnen, Waterloo, and Henry R. P. J. Schoumaker, Bruxelles, both of Belgium, assignors to La Soudure Electrique, Procedes Arcas, Andertecht, Belgium

Filed Mar. 23, 1970, Ser. No. 21,936
Claims priority, application Belgium, Mar. 31, 1969, 72146
Int. Cl. B23k *9/04*
U.S. Cl. 219—76 4 Claims



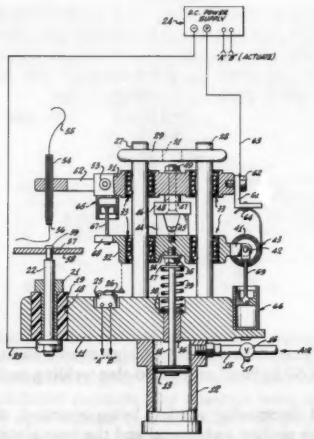
A process and device for high temperature heating of objects having extended surfaces. At least one group of separated plasmas jets is used which are created by a high current circulating between sets of cathodes and an anode having orifices with which the cathodes cooperate.

3,660,631

DUAL PRESSURE WELDING MACHINE

Larry R. Conley, Simi, Calif., assignor to Accra-Point Arrays Corp., Chatsworth, Calif.

Filed June 16, 1970, Ser. No. 46,770
Int. Cl. B23k *9/28, 11/10*
U.S. Cl. 219—78 23 Claims



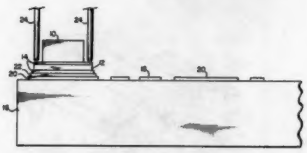
A dual pressure welding machine employing a magnetic connection to secure a first and higher pressure to cold flow or mechanically separate the insulation from a wire to be welded from the interfaces between an electrode, the wire and a terminal to which the wire is to be welded. When the magnetic connection is broken a second and lower welding pressure is applied from the electrode to the wire and terminal by means of a spring which may be a constant-force spring applying the same pressure regardless of its extended length or which may be an extension spring whose pressure increases with its extended length so that the welding pressure may be adjusted. The machine includes a pair of carriages connected together by the magnetic connection and the spring, with one carriage carrying the electrodes and the other moveable by either a pneumatic or manual operator.

3,660,632

METHOD FOR BONDING SILICON CHIPS TO A COLD SUBSTRATE

Charles Z. Leinkram, Bowie, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed June 17, 1970, Ser. No. 47,071
Int. Cl. B23k *1/02, 1/04*
U.S. Cl. 219—85 10 Claims



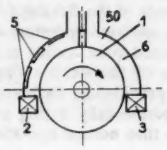
A method for bonding silicon chips to a cold substrate including the steps of mounting the chip on a gold plated Kovar tab; placing a solder preform on a gold lane of the substrate, positioning the tab on the solder preform, and passing a welding pulse through the Kovar tab to melt and reflow the solder preform.

3,660,633

DEVICE FOR THE STERILIZATION OF AMPOULES

Andre Fernand Meder, Saint-Louis, France, and Max Rudolf Jaeggi, Basel, Switzerland, assignors to Constr. Metalliques et Mecaniques EUGENE MEDER S.A., Saint-Louis, France

Filed Dec. 11, 1968, Ser. No. 782,909
Claims priority, application France, Dec. 11, 1967, 131733
Int. Cl. H05b *7/18*
U.S. Cl. 219—388 12 Claims



Device for the sterilization of ampoules comprising a rotatable drum, means for maintaining ampoules in position comprising at least one pair of wires maintained under tension on said drum, and sterilizing means for sterilizing ampoules held by said wires.

3,660,634

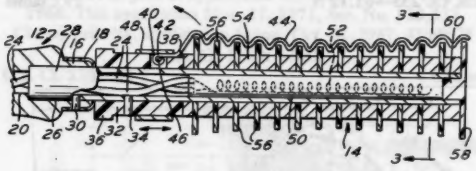
APPARATUS FOR TREATING NATURAL AND SYNTHETIC HAIR

Howard L. Scott, Philadelphia, Pa., assignor to The Fidelity Bank

Filed Aug. 14, 1970, Ser. No. 63,837
Int. Cl. H05b *3/00*; A45d *1/18, 24/10*
U.S. Cl. 219—222 3 Claims

A tool for straightening or otherwise setting natural or synthetic hair in a selected condition, said tool comprising a cylindrical heating means surrounded by a heat-conducting bushing and having radially extended, spaced-apart, heat-insulating discs projecting outwardly therefrom. The discs are arranged in spaced parallelism with each other to accommodate individual portions of strands of hair so that these

portions are separated from each other by said discs and retained in full contact with the heat-conducting bushing. A sinusoidal spring retainer strip is pivotally connected to the tool so that it is pivotally movable from a clamping position adjacent the parallel edges of the discs to a release position

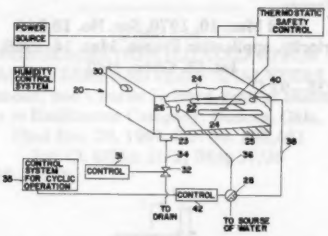


remote therefrom. The spring retainer strip is preferably pivotally connected to a guard means positioned between the cylindrical heating means and a heat-insulating handle connected to the heating means, said guard means comprising a sleeve surrounding the cylindrical heating means between the handle and the plurality of discs.

3,660,635
HUMIDIFICATION SYSTEM

Ralph C. Liebert, Worthington, Ohio, assignor to Liebert Corporation, Columbus, Ohio

Filed Nov. 12, 1970, Ser. No. 88,887
Int. Cl. F22b *1/28*
U.S. Cl. 219—273 **10 Claims**

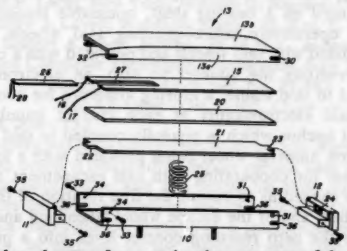


A method and apparatus for humidification characterized by a battery of low density stainless steel heaters which provide a band of radiant energy that evaporates water in an absolutely pure state without solids. An electronic control system provides automatic flushing, cleaning and fill cycles. The cleaning cycle includes the introduction of a spray of relatively cold water directed onto the heaters and the side walls of the reservoir to prevent the accumulation of deposits on the heaters and to clean precipitated solids from the walls of the reservoir.

3,660,636
PLATE HEATER

Adolf F. Beckert, St. Paul, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 3, 1971, Ser. No. 120,579
Int. Cl. F28f *3/00*
U.S. Cl. 219—388 **6 Claims**

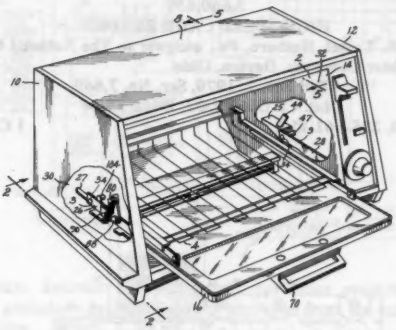


A plate heater for use in the process of heat treating travelling synthetic yarns with easily replaceable wear plate.

3,660,637
ELECTRIC OVEN TOASTER DOOR OPERATING MECHANISM

Lawrence L. Grove, Allentown, Pa., assignor to General Electric Company

Filed Mar. 10, 1971, Ser. No. 122,718
Int. Cl. A21b *3/02*
U.S. Cl. 219—413 **6 Claims**

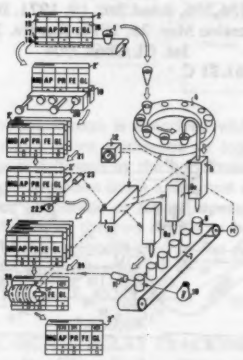


An electric oven toaster construction wherein a unique door holding mechanism is provided for securely holding a door in its closed position. A spring loaded bifurcated lever is moved behind an abutment for holding the door closed, and the lever is removed from the abutment when the door is moved to its opened position. The door holding mechanism may also be arranged as a door stop for permitting a toaster oven door to be automatically partially opened at the end of a cooking cycle.

3,660,638
AUTOMATIC ANALYZING APPARATUS FOR LIQUID SPECIMENS

Rudolf Oberli, Grubenstrasse 9, CH-4900 Langenthal, Switzerland

Filed Aug. 24, 1970, Ser. No. 66,469
Claims priority, application Switzerland, Aug. 28, 1969, 13028/69
Int. Cl. G01n *29/02, 33/16*; G06k *7/10*
U.S. Cl. 235—61.6 R **6 Claims**



Method and apparatus for performing at least one chemical and/or physical analysis on a specimen, characterized in that an origin record associated with each specimen is marked with a machine-readable code that is operable to activate selected ones of a series of analyzing stations in timed relation to the transport of the specimen therethrough. According to a first embodiment, inspection means are provided

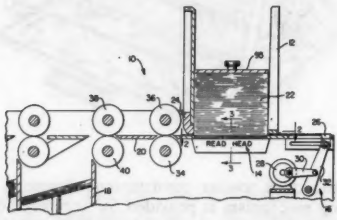
for measuring a physical property of the specimen following passage through said station, whereupon this measured property is then recorded directly on the origin record. In accordance with a second embodiment, a number of copies are made of the origin card corresponding to the number of analyses to be performed, whereupon the properties measured by said inspection means for each station are recorded on the said copies, respectively.

3,660,639

HIGH-SPEED CARD READER

John W. Cassel, Hatboro, Pa., assignor to The National Cash Register Company, Dayton, Ohio

Filed Feb. 2, 1970, Ser. No. 7,649
Int. Cl. G06k *7/02*; H01h *35/24*
U.S. Cl. 235—61.11 J **1 Claim**



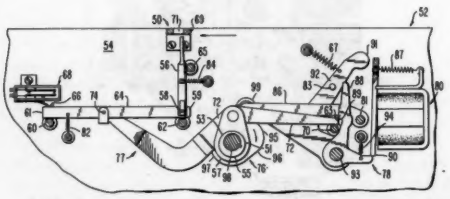
A high-speed card reader including a card feed hopper with a reading station being located directly beneath the hopper and aligned therewith. Because the reading station is aligned with the hopper, the lowermost card in a stack of cards in the hopper can be read while positioned at the bottom of the stack. After being read, the lowermost card is removed by a picker blade, and the next card is read while positioned at the bottom of the stack. All the holes in the card are read simultaneously at the reading station, which is air-operated.

3,660,640

RECORD SENSING MECHANISM

Paul L. Terbrueggen, Grosse Pointe Farms, and Georg K. Caspari, Plymouth, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Original application June 12, 1968, Ser. No. 736,488, now Patent No. 3,556,396, dated Jan. 19, 1971. Divided and this application Mar. 26, 1970, Ser. No. 30,612
Int. Cl. G06k *7/04*
U.S. Cl. 235—61.11 C **6 Claims**



The disclosure embodies a record processing tool and includes mechanism for activating the tool to detect a code hole in a record medium. The tool is activated by a lever selectively pivoted about one of two opposite-acting fulcrums by cyclically operable means, selection being dependent on the retraction of one of the fulcrums.

3,660,641

CODED DATA STORAGE MEDIUM

Joseph L. Levasseur, St. Louis, Mo., assignor to Simcom Corporation, High Ridge, Mo.

Filed Oct. 30, 1969, Ser. No. 872,595
Int. Cl. G06k *19/06*; G11b *5/78*; G06k *7/10*; G11b *5/25*
U.S. Cl. 235—61.12 N **19 Claims**

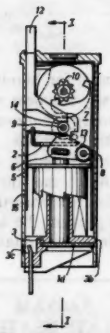
A coded data storage medium including a film strip having a particular form and arrangement of optically detectable images position encoded thereon.

3,660,642

IMPULSE COUNTER

Jean Jullien-Davin, Valence, France, assignor to Crouzet, Paris, France

Filed Mar. 10, 1970, Ser. No. 18,046
Claims priority, application France, Mar. 14, 1969, 6907796
Int. Cl. G06m *1/30*
U.S. Cl. 235—92 C **2 Claims**

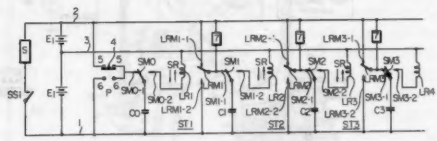


An electromagnetically operated impulse counter comprising a casing, numeral wheels disposed within said casing and freely mounted on a bearing shaft, releasable transmission means for operatively interconnecting said wheels, heart cams associated with said wheels and provided with a control lever for resetting the counter to zero, an electromagnet rigidly fixed to said frame, a moving armature for cooperating with said electromagnet at each current impulse, an escapement anchor which is pivotally coupled to said armature, the first numeral wheel being provided with a toothed escape wheel for cooperating with said escapement anchor which is so shaped as to permit the free rotation of the first numeral wheel and of the escape wheel when said anchor is brought by the zero resetting control lever into a position located between the two end positions thereof.

3,660,643
SHIFT REGISTER CIRCUIT

Mikio Matsumoto, Ashiya; Kenji Terada, Suita, and Mitsuru Matsunaga, Neyagawa, all of Japan, assignors to Tsubakimoto Chain Co., Osaka, Japan

Continuation-in-part of application Ser. No. 769,320, Oct. 21, 1968. This application Mar. 11, 1971, Ser. No. 123,333
Claims priority, application Japan, Oct. 31, 1967, 42/69578
Int. Cl. H03k *23/25*
U.S. Cl. 235—92 J 4 Claims

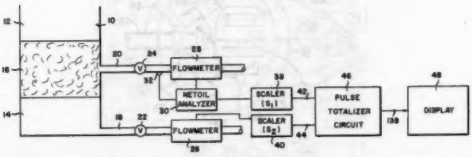


Shift register circuits in which each register stage comprises a magnetic lutch relay and a capacitor adapted to be coupled to a movable contact of said relay through a double-throw transfer switch, two stationary contacts of said relay being connected respectively to a reference potential and a first power source of a first potential, coil of said relay having one end connected to a second power source of a second potential lower than said first potential and the other end adapted to be coupled to the capacitor in the immediately preceding stage through the double-throw transfer switch in the immediately preceding stage.

3,660,644
SYSTEM FOR SUMMATION TOTALIZING FOR NET OIL ANALYZERS AND FLOW ANALYZERS

Jack Hammond, and Charles L. Boyd, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Dec. 29, 1969, Ser. No. 888,651
Int. Cl. G06m *3/12*; B65g *51/36*
U.S. Cl. 235—92 PL 7 Claims



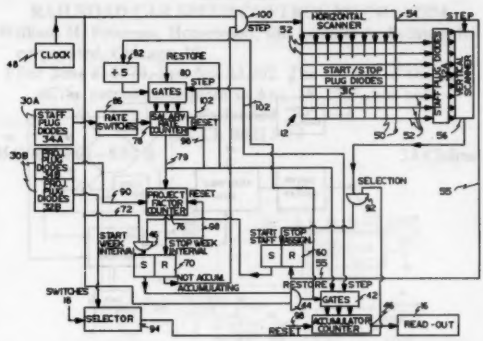
Method and apparatus for determining the total volume of water extracted from an oil/water separator by summing, without any loss of pulses due to the coincidence thereof, the pulses generated by a flowmeter in the free water knockout conduit with the pulses generated by a net oil analyzer indicative of water flow in the oil/water emulsion conduit.

3,660,645
CALCULATING DISPLAY BOARD

Charles P. Lecht, New York; William O. Harden, Chappaqua; Matthew J. Lavell, Wantagh; Stanley M. Kos, E. Northport, and Robert A. Pace, Jericho, all of N.Y., assignors to Advanced Computer Techniques Corporation, New York, N.Y.

Filed May 21, 1970, Ser. No. 39,482
Int. Cl. G06f *7/39*, *7/385*, *15/24*
U.S. Cl. 235—152 48 Claims

A display board incorporating an electronic digital calculator. The board is designed to display certain data concerning projects undertaken and the length of time various staff members are assigned thereto; and the calculator responds to the data displayed by computing a numerical project cost quantity. In addition to the displayed data, the calculator takes into account additional data relating to the various overhead factors pertaining to respective projects, and the various salary rates paid to staff members assigned to these

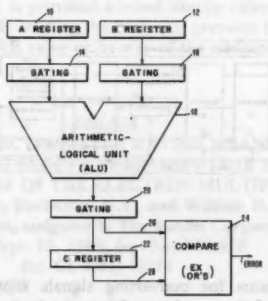


projects. Selector switches permit particular projects and time periods to be included in or excluded from the cost calculation.

3,660,646
CHECKING BY PSEUDODUPLICATION

Richard H. Minero, deceased, late of Raleigh, N.C. (by John Q. Beard, administrator); Anthony J. Anello; Robert G. Furey, and Lubos R. Palounek, all of Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 22, 1970, Ser. No. 74,340
Int. Cl. G06f *11/00*
U.S. Cl. 235—153 6 Claims



An error detection system is described which detects errors by performing a given arithmetic or logical operation using one data path followed by the performing of the same arithmetic or logic operation using a different data path. The results of the two arithmetic or logical operations are then compared, the failure of the two results to be identical indicating failure of a component used in the performance of the arithmetic or logical operation.

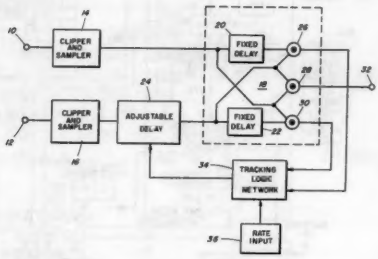
3,660,647
AUTOMATIC SIGNAL DELAY TRACKING SYSTEM

Cabell N. Pryor, Jr., Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Dec. 24, 1969, Ser. No. 887,832
Int. Cl. G06f *15/34*, *11/00*
U.S. Cl. 235—181 8 Claims

A system for varying the relative time delay between two broadband input signals consisting of an adjustable time

delay coupled to one of two input channels of a two point clipper correlator. The correlator includes a plurality of cross-coupled exclusive OR gates which generate output signals only when the correlation functions of both channels



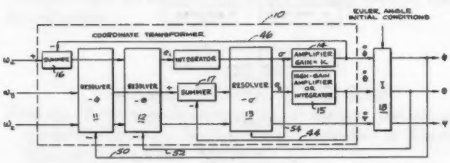
correspond. Decisions made in the correlator at each sample time are used to vary the adjustable delay, to provide automatic tracking of the peak of the cross-correlation function between the input signals.

3,660,648

ANGULAR RATE COORDINATE TRANSFORMER

Jack Kuipers, Grand Rapids, Mich., assignor to Northrop Corporation, Palos Verdes, Calif.

Filed Oct. 15, 1969, Ser. No. 866,637
Int. Cl. G06g *7/22, 7/78*
U.S. Cl. 235—186 **5 Claims**



Apparatus for converting signals representing rates of change of the angular position of a body with respect to its own axes to Euler angle rates of change utilizing three resolvers and two feedback paths so as to avoid practical difficulties equivalent to the "gimbal-lock" problem in the gyroscope art.

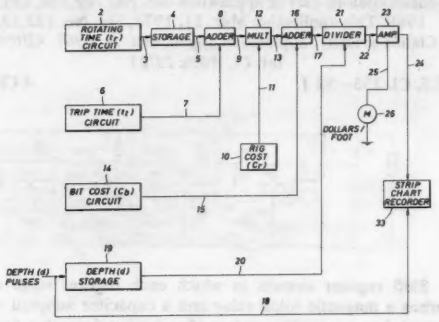
3,660,649

APPARATUS AND METHOD FOR COMPUTING DRILLING COSTS

Ralph E. Gilchrist, Houston, and Morton E. Brown, San Antonio, both of Tex., assignors to Tenneco Oil Company, Houston, Tex.

Filed Sept. 28, 1970, Ser. No. 75,864
Int. Cl. G06g *7/48;* **E21b** *45/00*
U.S. Cl. 235—193 **14 Claims**

Apparatus and method for computing the cost per unit length of borehole drilled by a drilling apparatus, as for example, the cost per foot of borehole drilled. First signals representative of incremental lengths of an interval of borehole depth drilled and a second signal representative of the accumulated cost incurred in drilling the interval of depth are generated and used to generate a third signal representative of average cost of operating the drilling ap-



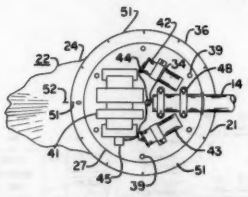
paratus during the interval of depth. The third signal may be read out and may be graphically recorded as a function of the depth drilled during the interval.

3,660,650

LUMINAIRE MOUNTING ASSEMBLY AND LIGHTING METHOD

Harold A. Van Dusen, Jr., South Milwaukee, Wis., assignor to McGraw-Edison Company, Milwaukee, Wis.

Filed Feb. 12, 1971, Ser. No. 115,024
Int. Cl. F21s *1/10, 3/10, 13/10*
U.S. Cl. 240—25 **10 Claims**



A luminaire assembly has an array of six luminaires mounted at the top of a high pole, and each of the luminaires has a preselected asymmetrical lighting pattern that is rotatably controllable by rotation of a lower optical assembly mounted on an upper main support housing. Rotation indexing mass on the assembly and housing indicate the relative position of the assembly to the housing to enable simply accomplished rotatable alignment of the overall lighting pattern.

3,660,651

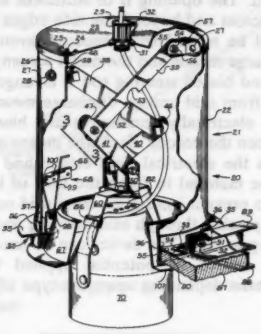
ADJUSTABLE LIGHT FIXTURE

Earl F. Miles, Jr., Indianapolis, Ind., assignor to Indy Lighting, Inc., Indianapolis, Ind.

Filed July 29, 1970, Ser. No. 59,152
Int. Cl. F21s *1/04*
U.S. Cl. 240—73 BJ **3 Claims**

An adjustable light fixture recessible in a ceiling for directing light at various angles toward an object. A shade having an electric light bulb is suspended within a housing by a pair of multi-membered arms. Each arm is adjustable for moving

the shade vertically. The shade is rotatably mounted to a handle for allowing the shade and bulb to pivot 180° about the horizontal mounting axis. The handle is rotatably



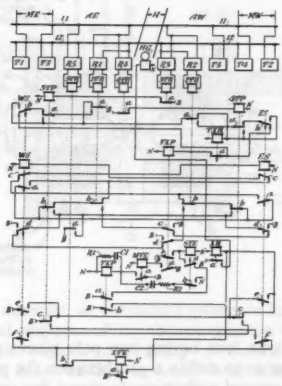
mounted to a U-shaped bracket fastened to the pair of arms allowing the shade and bulb to rotate about a vertical axis. Stops are provided to prevent tangling of the electric wires.

3,660,652

HIGHWAY CROSSING SIGNAL SYSTEM

Crawford E. Staples, Edgewood, and William A. Jacobs, Churchill, both of Pa., assignors to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Apr. 27, 1970, Ser. No. 31,909
Int. Cl. B61l *1/06*
U.S. Cl. 246—125 **7 Claims**



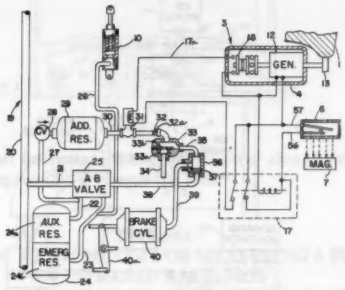
Two overlay track circuits without insulated joints are installed in the track approaching the highway crossing, overlapped to provide a speed measuring section at the distant end of the approach track and an approach control section extending to the crossing, but with all apparatus except track transmitters at the crossing. Detection of a train only in the measuring section actuates a set of timing relays, one for each selected speed range slower than maximum speed. Completion of the shortest timing period energizes a repeater relay having a basic slow release period which is extended by the successive completion of other timing periods. Entry of a maximum speed train into the approach control section immediately actuates the warning signal but operation is delayed for the established release period of the repeater relay for slower trains to obtain relatively uniform warning times. Two direction train operation doubles the required track circuits but uses only one set of timing relays when the same speed ranges are applicable.

3,660,653

RAILROAD CAR SPEED CONTROL MECHANISM

William H. Peterson, Homewood, Ill., assignor to Pullman Incorporated, Chicago, Ill.

Filed June 5, 1970, Ser. No. 43,902. The portion of the term of the patent subsequent to Aug. 18, 1987, has been disclaimed.
Int. Cl. B61l *3/12*
U.S. Cl. 246—182 B **13 Claims**



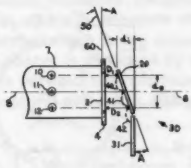
A railroad car speed control device including a car wheel-driven generator, a generator-operated solenoid valve and centrifugal switch being energized by a ground-mounted magnet for operating the air brakes in accordance with vehicle speed wherein a positive pressurehead is maintained on a pneumatic motor to keep the generator away from the car wheel, the generator wheel being provided with a shock-resistant flexible connection, a magnetic responsive reed switch having magnetic flux collecting means to be acted upon by a ground-mounted magnet for completing the generator circuit and wherein there is provided a novel shuttle valve arrangement for selectively sending the brake air pressure by way of the conventional AB valve or by way of the additional reservoir.

3,660,654

MASS SPECTROMETER HAVING MEANS COMPENSATING ELECTRON TRANSIT TIME ACROSS THE CATHODE OF THE ELECTRON MULTIPLIER

Donald C. Damoth, Rochester, N.Y., and William H. Shriner, Blanchester, Ohio, assignors to The Bendix Corporation

Filed Sept. 15, 1969, Ser. No. 858,058
Int. Cl. H01j *39/34*
U.S. Cl. 250—41.9 TF **2 Claims**



To improve the resolution of a mass spectrometer the emissive surface of the cathode for the electron multiplier is precisely angled with respect to the plane perpendicular to the axis of the ion focusing tube so that all ions of the same mass which pass through that plane at the same time impinge on those portions of the cathode surface closest to and farthest from the dynode cause electrons secondarily emitted therefrom to impinge upon the dynode at substantially the same time. This shortens the duration of the mass spectrum signals making it easier to distinguish one mass-spectrum line from another in the 200–500 amu range.

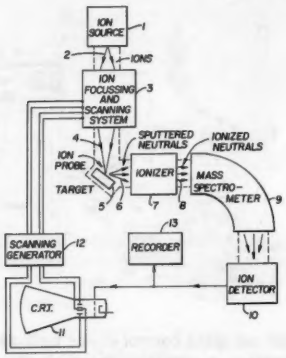
3,660,655
ION PROBE WITH MEANS FOR MASS ANALYZING NEUTRAL PARTICLES SPUTTERED FROM A SPECIMEN

Ian Robert Michael Wardell, Rugby, England, assignor to Associated Electrical Industries Limited, London, England

Continuation of application Ser. No. 703,600, Feb. 7, 1968, now abandoned. This application Sept. 8, 1969, Ser. No. 871,794

Int. Cl. H01j *37/26, 39/34;* **B01d** *59/44*

U.S. Cl. 250—41.9 SB **25 Claims**



In micro-analyzer apparatus of the kind in which material to be analyzed is arranged as a target of an ion probe and ionized particles obtained from the target are analyzed in a mass spectrometer, accuracy of analysis is improved by analyzing not secondary ions sputtered from the target but neutral atoms which are collected and passed to the mass spectrometer through an ionizer. Several possible forms of ionizer for ionizing the sputtered neutrals are also disclosed.

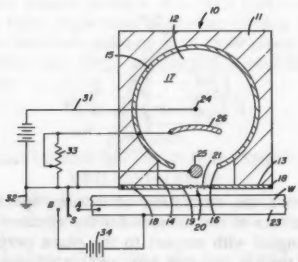
3,660,656
LIGHT LOCK FOR CORONA DEVICE

Lee F. Frank, and George W. Alley, II, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 26, 1970, Ser. No. 66,947

Int. Cl. G03g *15/02*

U.S. Cl. 250—49.5 ZC **12 Claims**



A device having corona discharge means for generating a flow of ions arranged within a chamber that is part of a dielectric housing and is provided with an elongated opening extending to the side of the housing positionable adjacent the surface of a moving sheet or web of dielectric or photosensitive material to be treated. The opening is covered with a metal screen or a small diameter rod can be arranged relative to the opening. The chamber is lined with an electrically conductive shield. The opening is of sufficient length so that it will extend across and beyond the side edges of the sheet or web that will be moved with respect thereto. Between the corona discharge means and the metal screen, an electrically conductive and biased steering rod is arranged to direct the flow of ions from said corona discharge means through said opening. An electrically conductive and biased plate is arranged between the corona discharge means and the steering rod to shape the electrical field established relative to the surface of the material to focus the flow of ions toward the screen and to prevent irradiation from said corona discharge means from passing through said opening and damaging the material being treated. The device can be used with either an AC or DC source of potential applied to the corona discharge means depending upon the type of material being treated.

3,660,657
ELECTRON MICROSCOPE WITH MULTI-FOCUSING ELECTRON LENS

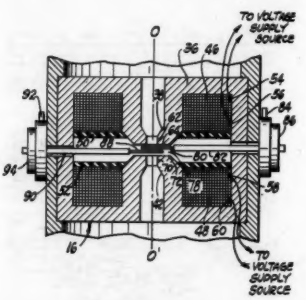
Kenneth A. Brookes, Standon, Ware, Herts, England, assignor to Associated Electrical Industries Limited, London, England

Filed Nov. 25, 1969, Ser. No. 879,877

Claims priority, application Great Britain, Nov. 26, 1968, 56,067/68

Int. Cl. H01j *37/26*

U.S. Cl. 250—49.5 D **10 Claims**



An electron lens having two pole pieces spaced along a lens axis so as to define a gap between the pole pieces, coil means associated with the pole pieces for, upon being energized, exciting the pole pieces to deflect an electron beam in a manner such that the beam intersects the lens axis at a plurality of points and thereby defining a plurality of focal points along the lens axis when the electron beam emerges parallel to the lens axis. The electron lens also includes an adjustable support means for positioning an object to be imaged.

3,660,658
ELECTRON BEAM DEFLECTOR SYSTEM

Hubert Leboutet; Jean Jaouen, and Jeanne Aucouturier, all of Paris, France, assignors to Thomson-CSF

Filed Mar. 4, 1970, Ser. No. 16,529

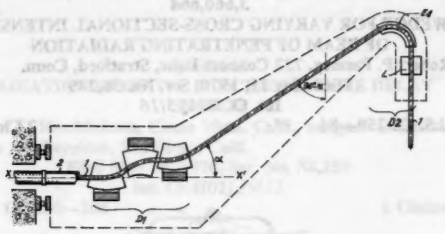
Claims priority, application France, Mar. 12, 1969, 6906976

Int. Cl. G01n *23/00*

U.S. Cl. 250—49.5 D **4 Claims**

A magnetic system for deflecting the beam in an electron accelerator, comprising two sets of electromagnets which

deflect the beam through a total angle of 90° and are located within in a single mounting, pivotally mounted about the axis of the entry beam.

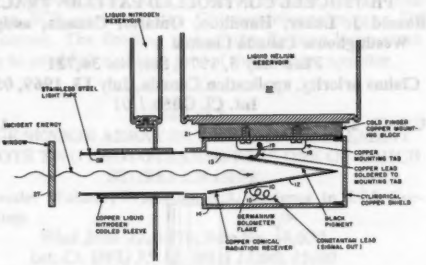


3,660,659

BLACK SUBMILLIMETER RADIATION DETECTOR

Wesley L. Eisenman; Douglas C. Arrington, both of Riverside; Richard L. Bates, San Diego; James D. Merriam, Del Mar, and Donald L. Stierwalt, El Cajon, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Feb. 3, 1971, Ser. No. 112,157
Int. Cl. G01j *1/02, 1/16*
U.S. Cl. 250—83.3 H **4 Claims**



A radiation detector, as a standard reference for determining the spectral response of any detectors in the submillimeter wavelength region, comprising a conical radiation receiver whose inner surface is coated with black pigment and having a bolometer flake of gallium doped germanium soldered to its outer surface substantially midway, between its base and apex, and a cooled light pipe for introducing radiant energy into the interior of the receiver.

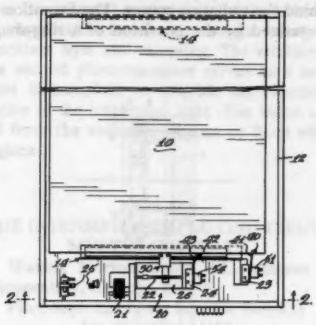
3,660,660

ACTUATOR FOR BUCKY DIAPHRAGMS

John R. Pearson, Aurora, and Glenn J. Johnson, Oswego, both of Ill., assignors to Mellquist Mfg. Co., Inc., Aurora, Ill.

Filed Mar. 21, 1969, Ser. No. 809,196
Int. Cl. G03b *41/16*
U.S. Cl. 250—62 **9 Claims**

Actuator for moving a diaphragm grid over photographic film during an X-ray exposure to screen secondary radiations from the film, comprising a drive shaft having thereon a pair of coextensive intersecting helical grooves of opposite hand which merge at their ends to form an endless track, a follower on the grid engaged in said track, and means for rotating said shaft for reciprocating said follower along said track thereby to move said grid over the film.

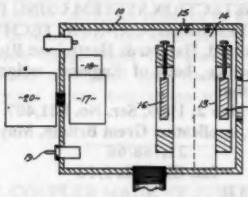


3,660,661

BALLISTIC JOULE METER FOR MEASURING A PULSE OF INFRARED RADIATION

Jean L. Lachambre, Charlesbourg, Quebec, Canada, assignor to Her Majesty the Queen in right of Canada as represented by the Minister of National Defence of Her Majesty's Canadian Government

Filed Aug. 20, 1970, Ser. No. 65,590
Claims priority, application Canada, Aug. 29, 1969, 060,797
Int. Cl. G01k *3/00*
U.S. Cl. 250—83.3 H **2 Claims**



There is disclosed a ballistic joule meter containing an absorber having a sufficiently low absorption factor that energy is transmitted beyond the face of the absorber and is absorbed throughout the volume thereof. The temperature rise due to the absorption of the pulse of radiation is measured by a thin wire electrical resistance thermometer. In order to cancel out ambient effects a reference absorber is also provided in the apparatus which is not exposed to the incident radiation and the energy is measured by measuring the temperature difference between the reference and operative absorber the temperature difference being measured with a bridge circuit.

3,660,662

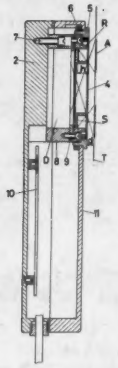
X-RAY APPARATUS FOR MEASURING PAPER WEB MOISTURE AND THE LIKE

Heikki Puolakka, Jyvaskyla, Finland, assignor to Valmet Oy, Helsinki, Finland

Filed Apr. 1, 1969, Ser. No. 811,852
Claims priority, application Finland, Apr. 3, 1968, 926/68
Int. Cl. G01t *1/16*
U.S. Cl. 250—83.3 D **7 Claims**

A pick-up is provided for a measuring device used to measure the moisture content, the filler content or the content of

coating material of a paper web or the like. The measuring takes place by the X-ray fluorescence method. The pick-up has a radiation source which is ring-shaped and is located on the same side of the paper web as the detector which is located behind the radiation source. The invention is particularly characterized by the provision of a ring-shaped radiation shield placed between the radiation source and the window of the detector. The dimensions of the radiation shield are so selected that a flat-top maximum is produced in a characteristic curve indicating the dependence of the measuring signal from the distance between the radiation source and the backing material, other characteristics remaining constant.

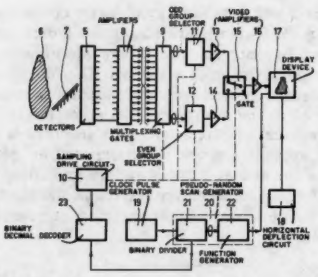


3,660,663

RADIATION DETECTION SYSTEM USING PSEUDO-RANDOM REVERSIBLE SCANNING TECHNIQUES

Leslie Henry Guildford, Haywards Heath, and Richard Frank Mitchell, Cambridge, both of England, assignors to U.S. Philips Corporation

Filed May 2, 1969, Ser. No. 821,407
Claims priority, application Great Britain, May 8, 1968, 21,788/68
Int. Cl. G01t 1/16
U.S. Cl. 250—83.3 H **22 Claims**



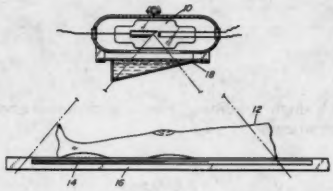
An imaging system including means for scanning a linear array of detectors across the scene to viewed field by field, consecutive fields being scanned in opposite directions. Every picture element of the scene is reproduced once during a frame, which is made up of at least two fields and preferably an integral multiple of two. The system also includes means for sampling the detectors in a pseudo random pattern. The sampled signals are multiplexed and displayed on a CRT having an electron beam that is deflected in synchronism with the sampling pattern. Each field is divided into a non-integral number of vertical areas.

3,660,664

WEDGE FOR VARYING CROSS-SECTIONAL INTENSITY OF BEAM OF PENETRATING RADIATION

Robert P. Pasmeg, 732 Connors Lane, Stratford, Conn.

Filed May 11, 1970, Ser. No. 36,249
Int. Cl. H01j 5/16
U.S. Cl. 250—86 **2 Claims**



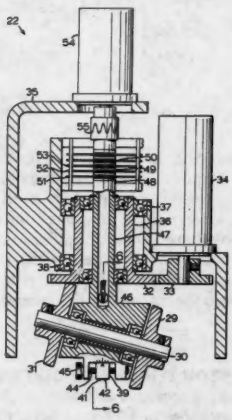
For use with an X-ray source, a wedge for distributing the intensity of radiation over an object area comprises a wedge-shaped enclosure partially filled with a radiation-opaque liquid. The enclosure is adapted for mounting on an X-ray tube head so as to be tiltable therewith thereby to alter the effective angle of incline of the "liquid wedge" and consequently its filtering characteristic.

3,660,665

PHOTOCELL CONTROLLED PATTERN TRACER

Ronald J. Luker, Hamilton, Ontario, Canada, assignor to Westinghouse Canada Limited

Filed May 5, 1970, Ser. No. 34,721
Claims priority, application Canada, July 13, 1969, 055,983
Int. Cl. G05b 1/01
U.S. Cl. 250—202 **4 Claims**



A friction drive and steering mechanism for a pattern tracing machine, such mechanism including a drive wheel frictionally engaging a drive surface and steerable about an axis intersecting the drive surface at a point displaced from the point of engagement of the drive wheel with the surface, and a photo-optical tracing head arranged to view an area on the

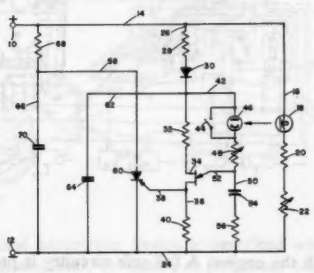
drive surface close to said steering axis and means for steering the viewed area about the steering axis in such a manner that a line is maintained between a point in the viewing area and the axis parallel to a tangent to the pattern in the viewing area.

3,660,666

RADIATION SENSITIVE ELECTRONIC TIME DELAY SWITCH

Alvin E. Hendrickson, Chula Vista, Calif., assignor to Hadrian J. Liberatore, San Diego, Calif.

Filed May 18, 1970, Ser. No. 38,259
Int. Cl. H01j *39/12*
U.S. Cl. 250—206 **6 Claims**



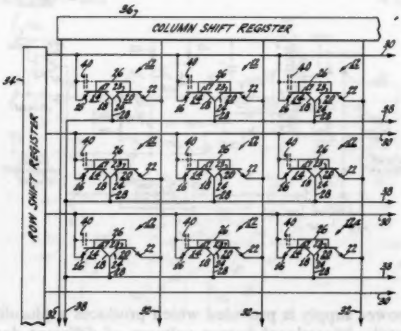
The charge rate of a charging capacitor is controlled by the resistance of a photocell that is in turn controlled by the flashing rate of a flashing light, and the charge level of the charge capacitor energizes a uni-directional device that biases an SCR device to the ON condition closing a DC power circuit. The flashing rate of the flashing lamp is adjustable to establish a charge rate of the charge capacitor.

3,660,667

IMAGE SENSOR ARRAY IN WHICH EACH ELEMENT EMPLOYS TWO PHOTOTRANSISTORS ONE OF WHICH STORES CHARGE

Paul Kessler Weimer, Princeton, N.J., assignor to RCA Corporation

Filed June 22, 1970, Ser. No. 48,032
Int. Cl. H01j *35/12;* **H01l** *11/00, 15/00*
U.S. Cl. 250—209 **9 Claims**



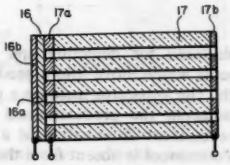
An image sensor array of photodetector elements, with two phototransistors at each element. Each phototransistor has emitter, base, and collector regions, with PN junctions between the regions serving as photodetectors which integrate incident light flux. The inherent capacitance of the emitter-base junction of one phototransistor is substantially greater than the inherent capacitance of the other junctions, to provide capacitance for charge storage during the period between incident light and sampling. The emitter-base junction of the second phototransistor serves as a switch when the element is sampled, to provide an electrical output representative of the integrated light. The video output may be derived from the collector regions or from either of the emitter regions.

3,660,668

IMAGE INTENSIFIER EMPLOYING CHANNEL MULTIPLIER PLATE

Adolph J. Wolski, Morton Grove, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Sept. 25, 1969, Ser. No. 860,931
Int. Cl. H01j *31/50*
U.S. Cl. 250—213 VT **6 Claims**



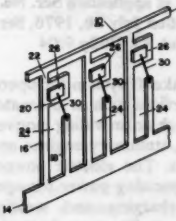
A photocathode in response to an incident light image develops a corresponding electron image which is accelerated and focused upon the input of a channel multiplier plate. The input of that plate is covered with a layer of a material having the property of transmission secondary electron multiplication, hereafter referred to as TSEM. Secondary electrons developed in that material in response to the incident electron image enter the channel multiplier where they are further multiplied and, finally, are focused on a phosphor screen where conversion to a light image takes place.

3,660,669

OPTICAL COUPLER MADE BY JUXTAPOSITION OF LEAD FRAME MOUNTED SENSOR AND LIGHT EMITTER

Lawrence A. Grenon, Phoenix, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Apr. 15, 1970, Ser. No. 28,585
Int. Cl. H01j *5/02, 39/12*
U.S. Cl. 250—217 S **5 Claims**



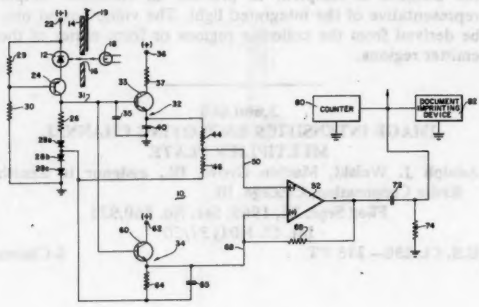
An inexpensive encapsulated coupled pair of elements, one of which is a light emitter and the other of which is a light sensor, comprise an encapsulated optical coupler, and the method of making them is disclosed.

3,660,670

DOCUMENT DETECTING AND COUNTING APPARATUS

Dwight Thomas Howard, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 21, 1970, Ser. No. 99,866
Int. Cl. G01n 21/30
U.S. Cl. 250—219 DC 5 Claims



Apparatus is disclosed for detecting and counting the number of documents which move into a predetermined location along a path. The apparatus includes a photosensitive device disposed adjacent the predetermined location and adapted to receive incident illumination at a first level of brightness when a document is absent from the location and at reduced brightness level when the document moves into the location. The photosensitive device has a parameter, the magnitude of which varies as a function of the brightness level of incident illumination. The apparatus further includes a first amplifier stage which is electrically coupled to the photosensitive device, and is adapted to produce and store a first reference voltage at a level which is a function of the level of brightness of incident illumination received by the photosensitive device when the document is absent from the predetermined location; and a second amplifier stage adapted to produce a second reference voltage at a level which is a function of the instantaneous brightness level of illumination incident on the photosensitive device. The apparatus further includes an operational amplifier which produces an output which is a function of variations between the levels of the reference voltages, and a high pass filter which is coupled to the operational amplifier and adapted to produce a pulse when a document moves into the predetermined location, and a counter which in response to each pulse keeps a record of the number of documents which have moved past the predetermined location.

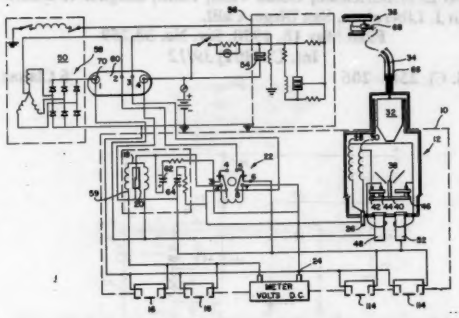
3,660,671

ELECTRIC POWER TAKEOFF SYSTEM

Edwin R. Peterson, 3109 Bogus Basin Rd., Boise, Idaho

Continuation-in-part of application Ser. No. 8,853, Feb. 5, 1970. This application July 20, 1970, Ser. No. 56,546
Int. Cl. H02p 9/04
U.S. Cl. 290—1 10 Claims

An electric power takeoff system for operative association with electric output devices such as alternators or generators driven by an engine such as providing motive power for vehicles of different types, stationary engines and other types of power plant apparatus. The electric power takeoff system operates to provide operating power for operating electrical appliances, battery charging and welding attachments, directly therefrom, the appliances and attachments operating on DC current in voltage ranges from 1 to 220 volts DC. The system includes a means of adjusting electric output by changing the rpm of the engine driving the alternator, so as to match voltage requirement on appliances being operated, or combination thereof, the functions being performed through the system and automatically operable upon actuation of an appliance switch when connected into the system and engine speed, and therefore electric power output, will be automatically established upon actuation of the appliance. The system includes an automatic, electromagnetic working solenoid functioning to increase engine speed and also change circuitry to provide a fail safe system to preclude endangering an alternator, regulator or electrical system associated with the engine. A fail safe circuitry is provided to accommodate operating the system for battery charging in voltage ranges of 1–220 volts DC and polarity protection is incorporated within the on-off switch circuitry in the event of improper hookup to a battery being charged. The system also incorporates a safe and simple hook-up feature for quick association with a vehicle system incorporating such an engine providing pre-assembled and connected wiring.

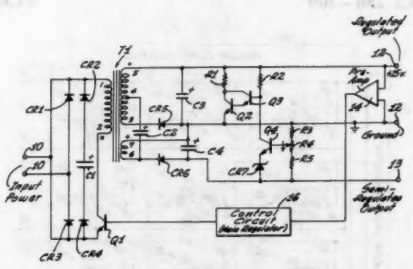


3,660,672

POWER SUPPLY DUAL OUTPUT

James K. Berger, Sherman Oaks, and Bruce L. Wilkinson, Torrance, both of Calif., assignors to Pioneer Magnetics, Inc., Santa Monica, Calif.

Filed Feb. 25, 1971, Ser. No. 118,661
Int. Cl. H02m 7/24
U.S. Cl. 307—17 5 Claims

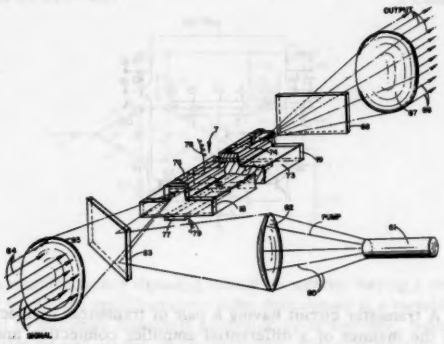


A power supply is provided which produces a plurality of separate unidirectional output voltages of different degrees of regulation as determined by the requirements of the equipment energized thereby. The power supply includes a transformer and a regulating network, and it produces a first regulated unidirectional potential output; and the power supply also includes a circuit for obtaining at least one additional regulated unidirectional potential output from the same transformer and regulator.

3,660,673
OPTICAL PARAMETRIC DEVICE

Dean B. Anderson, Whittier, Calif., assignor to North American Rockwell Corporation

Continuation of application Ser. No. 605,443, Dec. 28, 1966. This application Apr. 16, 1970, Ser. No. 31,814
Int. Cl. H03f 7/00
U.S. Cl. 307—88.3 11 Claims

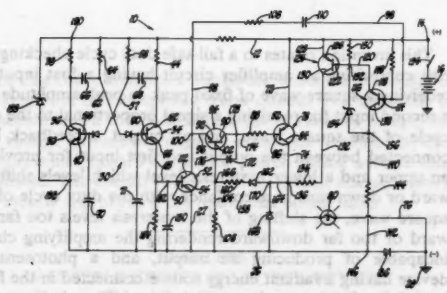


An optical parametric device is described which may be used as an amplifier, oscillator, or frequency converter, and which is operable in the infrared or visible spectral regions. The device utilizes a dielectric optical waveguide or tuned cavity, which structure may comprise the depletion layer of a semiconductor junction, the dielectric material of which exhibits nonlinear susceptibility. An intense, appropriately oriented, optical pump induces a non-linear electric polarization in the material of the dielectric structure. Traveling wave or discrete circuit parametric interaction occurs within the structure between the pump and an input signal. Under appropriate conditions, oscillation, amplification, and/or frequency conversion may be obtained.

3,660,674
TRANSISTOR FLASHER WITH PREHEAT CIRCUIT FOR LAMP LOAD

John F. Bolinger, Michigan City, Ind., assignor to Meridian Industries, Inc., Southfield, Mich.

Filed June 22, 1970, Ser. No. 48,322
Int. Cl. H02h 7/20; H05b 37/02
U.S. Cl. 307—202 4 Claims

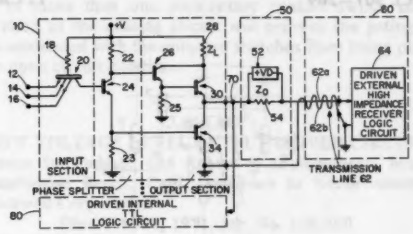


A flasher circuit has a power transistor controlling a circuit with a load therein; a multivibrator produces a timing signal applied to a second transistor for pulsing and turning "on" a related third control transistor which is effective in response thereto to apply a relatively small current flow to the load to preheat the load before application of the full current; additional semiconductor means, sensitive to a voltage signal or loss thereof in the load circuit due to the occurrence of a short, are effective for preventing the power transistor from being made conductive.

3,660,675
TRANSMISSION LINE SERIES TERMINATION NETWORK FOR INTERCONNECTING HIGH SPEED LOGIC CIRCUITS

John R. Andrews, Jr., Framingham, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 5, 1970, Ser. No. 34,675
Int. Cl. H03k 19/36
U.S. Cl. 307—208 17 Claims

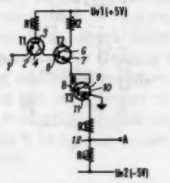


A series termination network interconnects high speed logic circuits in a transmission line system for transmitting binary ONE and binary ZERO information. When the logic circuit drives the transmission line to a high voltage state, a first impedance branch of the termination network applies a voltage whose magnitude approximates one half of the magnitude of voltage which defines a binary "ONE." When the logic circuit switches the line to a low voltage state, corresponding to a binary ZERO, the network through a second impedance branch terminates the line in its characteristic impedance.

3,660,676
CIRCUIT ARRANGEMENT FOR CONVERTING SIGNAL VOLTAGES

Werner Fleischhammer, Brunnthal, and Friedrich-Karl Kroos, Soecking, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Dec. 15, 1970, Ser. No. 98,267
Claims priority, application Germany, Jan. 7, 1970, P 20 00 401.7
Int. Cl. H03k 19/12
U.S. Cl. 307—208 5 Claims



A logic signal level converter circuit arrangement for connecting the output of a saturated type logic circuit to the input of an unsaturated logic circuit, in which at least one input signal terminal is connected via a respective rectifying junction to a common point that is connected via a resistor to a first supply voltage terminal, the common point being connected via a further rectifying junction to the base of an emitter-follower transistor whose collector is connected to

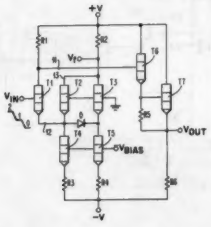
said first supply voltage terminal via a resistor, the emitter of said emitter follower transistor being connected to the base and collector of a multi-emitter transistor which has one emitter connected to a point of fixed potential and a second emitter connected to a second supply voltage terminal of polarity opposite to that of said first supply terminal via a voltage divider consisting of two resistors connected in series and having their junction connected to an output terminal.

3,660,677

INTERCHANGER 1 CIRCUITS

Gerald A. Maley, Fishkill, and James L. Walsh, Hyde Park, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 5, 1971, Ser. No. 113,000
Int. Cl. H03k *19/08, 19/40*
U.S. Cl. 307—209 **11 Claims**



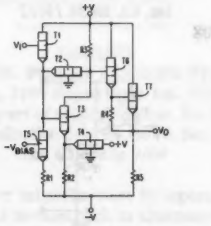
A ternary logic circuit provides the Interchanger 1 logic function whereby for an input of levels 0, 1 or 2 there arises an output with levels 2, 1 or 0, respectively. A transistor current switch has two current paths only one of which includes a load impedance, the other current path bypassing the load impedance. A current source provides two units of current. Either none, one or both of the current units flow in the load impedance to provide the respective output levels, depending upon the input signal.

3,660,678

BASIC TERNARY LOGIC CIRCUITS

Gerald A. Maley, Fishkill, and James L. Walsh, Hyde Park, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 5, 1971, Ser. No. 112,898
Int. Cl. H03k *19/08, 19/40*
U.S. Cl. 307—209 **10 Claims**



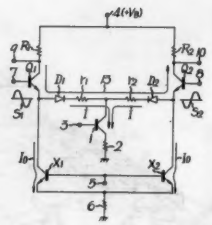
Basic ternary logic circuits provide all 27 single-variable ternary logic functions. Each of two current switches comprises a pair of transistors. Each transistor has an emitter connected to a respective one of a pair of current sources. The collector of one transistor of each current switch is connected to a load impedance and the collector of the other transistor is connected to a power supply. The input is at the base of one of the current switch transistors. The signal at the junction of the load impedance and the collectors is transmitted to the output by an emitter follower.

3,660,679

TRANSISTOR CIRCUIT

Yoshio Ishigaki, and Hajime Shinoda, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 24, 1970, Ser. No. 31,536
Claims priority, application Japan, May 1, 1969, 44/34194
Int. Cl. HO3k *5/01*
U.S. Cl. 307—231 **7 Claims**



A transistor circuit having a pair of transistors connected in the manner of a differential amplifier connection and a pair of diodes respectively connected with the transistors, which diodes constituting a series connection between the pair of transistors.

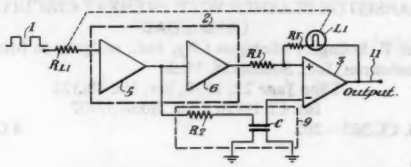
A control element is connected between the pair of diodes in order to give switching operation to the diodes.

3,660,680

FAIL-SAFE DUTY CYCLE CHECKING CIRCUIT

Reed H. Grundy, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Sept. 23, 1970, Ser. No. 74,787
Int. Cl. H03k *5/18*
U.S. Cl. 307—234 **20 Claims**



This invention relates to a fail-safe duty cycle checking circuit comprising an amplifier circuit having a first input for receiving a square wave of fixed peak to peak amplitude and a second input for receiving a signal proportional to the duty cycle of the square wave, and an output, a feedback loop connected between the output and first input for providing an upper and a lower hysteresis level which levels shift upward or downward in accordance with the duty cycle of the square wave, the shifting of the hysteresis levels too far upward or too far downward rendering the amplifying circuit incapable of producing an output, and a photosensitive device having a radiant energy source connected in the feedback loop for monitoring its condition. The photosensitive device also has a photopositive resistive element connected to the first and second inputs of the amplifier circuit to assume a high impedance condition whenever the radiant energy source emits no radiant energy thereby rendering any square wave input incapable of producing an output from the amplifying circuit.

3,660,681

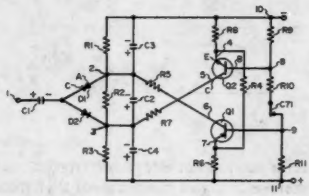
SIGNAL TRANSMISSION SYSTEM WITH A VARIABLE LEVEL CLIPPING CIRCUIT

Noel Vlaeminck, Antwerp, Belgium, assignor to Automatic Electric Laboratories, Inc., Northlake, Ill.

Original application Jan. 29, 1968, Ser. No. 701,264, now Patent No. 3,562,745. Divided and this application Mar. 26, 1970, Ser. No. 30,615

Int. Cl. H03k *5/08*

U.S. Cl. 307—237 **1 Claim**



A multifrequency signaling system transmitter having a circuit to clip the multifrequency pulse data signals at a variable level to minimize transients generated upon switching signal sources on and off the transmission line. The clipping level is determined by the voltage applied across a pair of diodes by an exponentially varying voltage of charging or discharging capacitors, varying from a completely short-circuited state when the diodes are conducting in series, to the maximum value of the signal when the diodes are non-conductive. The charging or discharging of these capacitors is controlled by a pair of transistors that are switched by an external circuit applying the signal to the line.

3,660,682

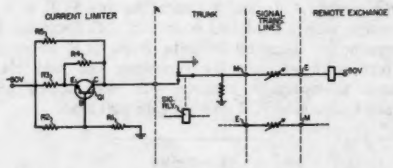
CURRENT LIMITING CIRCUIT

Todd H. Gartner, Franklin Park, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Feb. 1, 1971, Ser. No. 111,217

Int. Cl. H03k *5/08*

U.S. Cl. 307—237 **2 Claims**



The disclosure includes a transistor connected in the signal applying path of a telephone trunk circuit. The transistor is connected into a circuit configuration of resistors to operate as a voltage controlled "negative-resistance" shunted by the resistors which absorb the excess power during adverse line conditions. The overall voltage-current circuit characteristics very closely approximate the traditional ballast lamp.

3,660,683

MULTIPLE CHOICE SELECTOR DEVICE

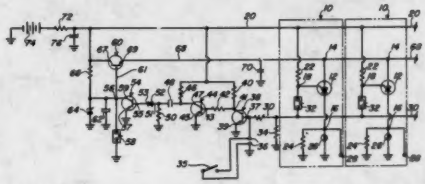
William Wangard, Maywood, Ill., assignor to Walter E. Heller & Company, Chicago, Ill.

Filed May 11, 1970, Ser. No. 36,258

Int. Cl. H03k *17/00*

U.S. Cl. 307—252 K **11 Claims**

Electronic gating circuits are provided to yield closed current paths upon actuation of associated momentary contact switches. An erasing circuit is also energized upon actuation of a momentary contact switch to cause electronic gating circuits previously placed in the closed current path condition to be returned to an open circuit condition. Continued actuation of more than one momentary contact switch during operation of the erasing circuit will prevent the gating circuits associated with the actuated switches from being placed in an open circuit condition.



3,660,684

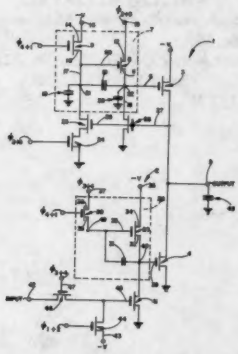
LOW VOLTAGE LEVEL OUTPUT DRIVER CIRCUIT

Clarence W. Padgett, and Robert W. Polkinghorn, both of Huntington Beach, Calif., assignors to North American Rockwell Corporation

Filed Feb. 17, 1971, Ser. No. 116,050

Int. Cl. H03k *3/26*

U.S. Cl. 307—270 **3 Claims**



The output is precharged to a voltage level slightly in excess of the threshold voltage level of the field effect transistors implementing the driver circuit. A bootstrap circuit is used for decreasing the time required to drive the output to the voltage level. A feedback circuit from the output disables the bootstrap circuit for limiting the output voltage level and for reducing additional power consumption in the circuit after the output has been driven to the required voltage level. An input evaluation circuit changes the output voltage level or permits it to remain unchanged as a function of the input voltage level.

3,660,685

PULSE GENERATING TRANSFORMER CIRCUIT

James K. Berger, Sherman Oaks, Calif., assignor to Pioneer Magnetics, Inc., Santa Monica, Calif.

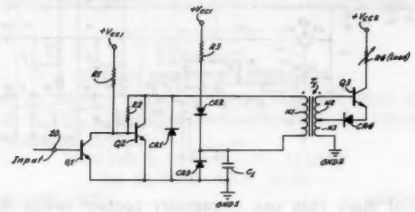
Filed Feb. 25, 1971, Ser. No. 118,704

Int. Cl. H03k *5/00*

U.S. Cl. 307—260 **6 Claims**

A pulse generating transformer circuit is provided for producing a series of uni-polar pulses of variable amplitude

and duration, and in which the transformer is reset between successive pulses within a time independent of the product of the amplitude and duration of the individual pulses produced by the circuit. In this way, there is no limitation of the rapidi-



ty with which the successive pulses produced by the circuit may follow one another. The circuit of the invention achieves its desired purpose by connecting a winding of the transformer in parallel with a capacitor to form a resonant circuit which is effective for one half-cycle.

3,660,686

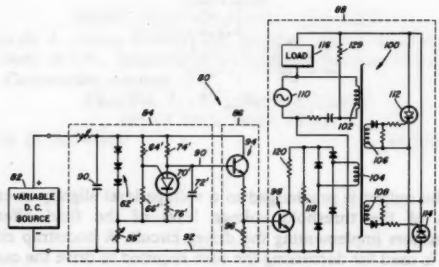
RAMP GENERATOR AND VARIABLE DUTY-CYCLE SWITCHING CIRCUIT

Nicholas G. Muskovac, Rockville, Md., assignor to Vectrol, Inc., Rockville, Md.

Filed Apr. 29, 1970, Ser. No. 32,806

Int. Cl. H03k *17/00*

U.S. Cl. 307—252 N **19 Claims**



A low noise level adjustable solid state circuit for controlling the power reaching a load. A sawtooth ramp generator is powered by a DC analog control voltage and delivers a signal to the primary control winding of a square loop core transformer, the secondary winding of which controls the operation of a pair of solid state thyristor switches. The ramp generator, in one embodiment produces a sawtooth signal which is variable in amplitude and which rides on top of a variable DC voltage level and, in another embodiment, produces a sawtooth signal of constant amplitude and which rides on top of a variable DC voltage level. The secondary winding of the transformer provides gating signals to the thyristor switches only when the trailing edges of the gate pulses occur within the half-cycle of positive anode bias.

3,660,687

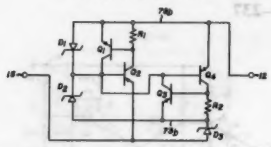
HYSTERESIS-FREE BIDIRECTIONAL THYRISTOR TRIGGER

William H. Sahm, III, and Taras Shepelavy, both of Syracuse, N.Y., assignors to General Electric Company

Filed Feb. 12, 1971, Ser. No. 114,934

Int. Cl. H03k *3/31, 17/66, 17/68*

U.S. Cl. 307—252 B **6 Claims**



A semiconductor monolithic integrated trigger control circuit for low hysteresis firing of bidirectional thyristors is provided having a non-symmetrical voltage-current characteristic.

3,660,688

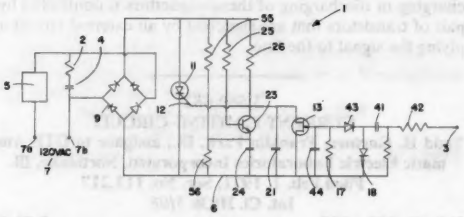
STATIC SWITCH

Robert W. Evans, and Stuart P. Jackson, both of Columbus, Ohio, assignors to Delta Venture, Columbus, Ohio

Filed Dec. 7, 1970, Ser. No. 95,767

Int. Cl. H03k *17/00*

U.S. Cl. 307—252 W **6 Claims**



A touch switch circuit is disclosed for connecting a load to a source of AC potential in response to operator contact with a touch probe. A normally nonconducting SCR is in series connection with a load and source of AC potential. Means are present for clamping the gate of the SCR below its normal turn-on level, and for removing the said clamp in response to operator contact with said touch terminal whereby to fire said SCR and activate said load.

3,660,689

TIMING SIGNAL GENERATING SYSTEM FOR INTERNAL COMBUSTION ENGINES

Kazuo Oishi; Tokuhiro Kurebayashi; Noriyoshi Ando; Noboru Yamamoto, and Hiroshi Yoshida, all of Kariya, Japan, assignors to Nippondenso Kabushiki Kaisha, Aichi-ken, Japan

Continuation-in-part of application Ser. No. 36,767, May 13, 1970, now abandoned. This application Sept. 8, 1970, Ser. No. 70,453

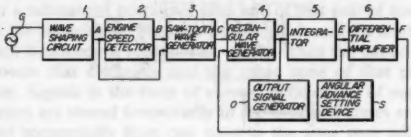
Claims priority, application Japan, May 14, 1969, 44/37278; Sept. 9, 1969, 44/71362; 44/71365

Int. Cl. H03k *5/00, 17/00;* F02p *1/00*

U.S. Cl. 307—269 **25 Claims**

A timing signal generating system for internal combustion engines having a wave shaping circuit generating a pulse signal in response to an output signal generated by a signal generator at a fixed rotational angle of the engine. A sawtooth wave having a fixed magnitude is generated by a sawtooth wave generator in synchronism with the pulse signal and is reset at a fixed angular reference point. A rectangular

wave whose on-off ratio is related to a preset signal from an angular advance setting device or from a setting voltage generator is derived from the saw-tooth wave and is integrated. A timing output signal is derived from the rectangular wave. The integrated output of the rectangular wave which is linearly related to the ignition or fuel injection timing and the preset signal from the angular advance setting



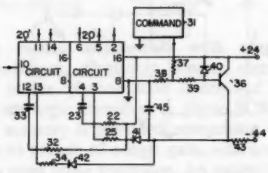
device are compared and the resulting difference signal is fed back to means for generating the rectangular wave. This arrangement provides for a constant check on whether or not the ignition or fuel injection timing agrees with the preset signal, thus determining the ignition or fuel injection timing accurately without being affected by changes in external conditions.

3,660,690

ELECTRICAL ADJUSTMENT OF TIME-CONSTANT APPARATUS

Charles Theodore, Huntington Beach, Calif., assignor to LTV Ling Altec, Inc., Anaheim, Calif.

Filed Nov. 9, 1970, Ser. No. 87,689
Int. Cl. H03k *3/10*
U.S. Cl. 307—293 **2 Claims**



An auxiliary circuit for adjusting the time-constant of electrical apparatus, such as that of a relaxation oscillator having resistor-capacitor time-constant circuit elements. The adjustment is maintained while an electrical adjusting signal is present. This biases a transistor into conduction and places a second resistor in parallel with the basic resistor of the time-constant circuit, thereby reducing the time-constant. Alternate embodiments selectively allow plural adjustments, also adjustment of plural separate electrical devices.

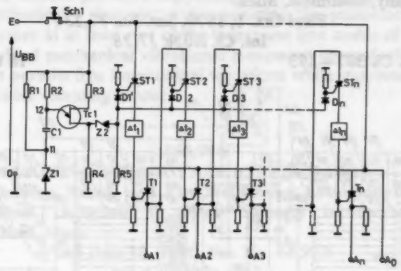
3,660,691

INTERVALOMETER

Basilius Glawleschkoff, Munich; Gebhard Krieg, Germering; Wolfgang Weidmann, and Adolf Weiss, both of Munich, all of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Filed Nov. 9, 1970, Ser. No. 87,817
Claims priority, application Germany, Dec. 11, 1969, P 19 62 259.4
Int. Cl. H03k *4/00*
U.S. Cl. 307—293 **9 Claims**

Intervalometer with a uni-junction transistor in the interval timer. For the triggering of a series of intervalometer outputs there is provided only a single interval timer, said latter utilizing a capacitor therein. A Zener diode is connected between the capacitor and the ground connection and a resistor is connected from a point between the capacitor and the Zener diode to the positive potential. Switching thyristors triggered by suitably arranged control thyristors are triggered in parallel through suitable time delay elements for energizing the outputs.

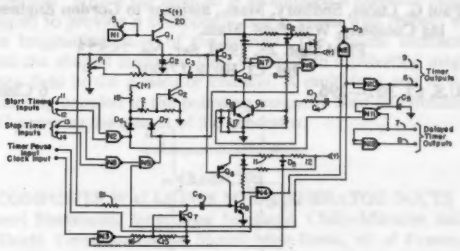


3,660,692

ELECTRONIC INTERVAL TIMER

Peter G. Bartlett, Davenport, Iowa, assignor to Struthers-Dunn, Inc., Pitman, N.J.

Filed Nov. 9, 1970, Ser. No. 88,014
Int. Cl. H03k *17/28*
U.S. Cl. 307—293 **8 Claims**



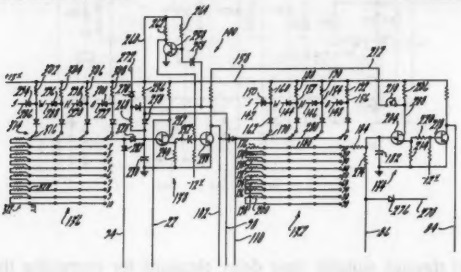
An electronic interval timer employing integrated circuits and providing a high degree of accuracy in timing. The timer comprises a first timing circuit which demarcates the preselected interval to be timed, and a second short-term interval timer which times successive short, fixed intervals each of which is a submultiple of the preselected interval. Clock pulses are applied to the short-term timer, and each such clock pulse causes it to go through its short-term timing operation. A timing capacitor included in the first timing circuit undergoes a change in the amount of charge stored thereon only during each interval timed by the second timer. Consequently, a predetermined number of successive operations by the second timer must occur to vary the charge on said capacitor from a preselected initial amount to a predetermined final level representative of the completion of timing. Since the frequency of operation of the short-term timer is controlled by the clock pulses, a very high degree of timing accuracy is obtained. The timer includes means which ensures that the change in the amount of charge on the short-term timer is always the same, even for substantial variations in temperature and supply voltage. Provision is made for resetting the timer at any time and also for interrupting the timing in such a manner that the amount of time already demarcated by the timer is stored and only the remainder of the pre-set interval is timed when timing is once again initiated.

3,660,693

ANALOG TENS AND UNITS TIMER WITH SOURCE SYNCHRONIZATION

James F. Markey, Detroit, Mich., assignor to Weltronic Company, Southfield, Mich.

Filed Oct. 1, 1970, Ser. No. 77,234
Int. Cl. H03k *17/28*
U.S. Cl. 307—293 **18 Claims**



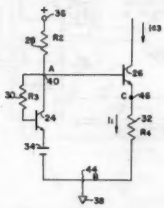
A timing system for use in conjunction with a welding system, wherein the timing system consisting of separate tens and units counters, the counters being electronically controlled to select the tens counter prior to the selection of the units counter. A system is provided for generating synchronizing pulses and a bistable circuit, in the form of a flip flop, is utilized to switch from the tens counter to the units counter upon completion of the tens count.

3,660,694

CURRENT SOURCE

Paul G. Lucas, Sudbury, Mass., assignor to Gordon Engineering Company, Wakefield, Mass.

Filed Sept. 25, 1970, Ser. No. 75,573
Int. Cl. H03k *17/00*
U.S. Cl. 307—296 **6 Claims**



A first resistor is connected between the collector and base of a first transistor of a matched pair and a second resistor is connected in the emitter circuit of a second transistor of the matched pair. The impedance of the first resistor is equal to the impedance of the second resistor. The first resistor is provided for increasing the emitter current of the second transistor to compensate for loss in the base current of the second transistor due to the finite and changing beta characteristics of the transistors.

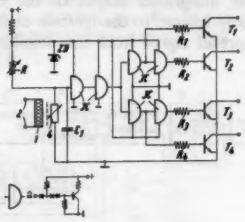
3,660,695

CONTACTLESS RELAY

Karl Schmitt, Achern, Germany, assignor to Gehap Gesellschaft Handel and Patentverwertung GmbH & Co. KG, Achern, Germany

Filed Oct. 5, 1970, Ser. No. 77,848
Claims priority, application Germany, Oct. 8, 1969, P 19 50 687.7; Oct. 21, 1969, P 20 28 187.2; June 9, 1970, P 19 52 818.8
Int. Cl. H03k *17/00*
U.S. Cl. 307—309 **11 Claims**

A contact free relay having an electromagnetic control circuit and one or more electronic switching circuits disposed in the magnetic field of the electromagnetic control circuit, wherein the contact free elements are controlled by the magnetic field. The contact free elements are magnetic responsive resistors connected to one or more controllable semiconductors and mounted within the exciting coil field between one or more ferromagnetic yoke plates.

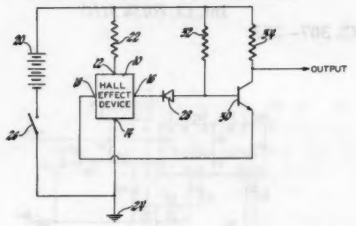


3,660,696

HALL EFFECT SWITCHING DEVICE

Albert D. Rittmann, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of application Ser. No. 850,554, Aug. 15, 1969, now abandoned. This application Jan. 14, 1970, Ser. No. 2,861
Int. Cl. H01c *7/16*
U.S. Cl. 307—309 **1 Claim**



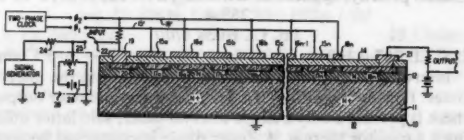
A Hall effect switching circuit including a Hall effect device having two input contacts and two output contacts. A source of electric power is connected across the two input contacts, and one of the output contacts is connected to the emitter of a transistor and the other output contact is connected to the base of the transistor through a diode. A resistor connects the base of the transistor to a terminal of the source of electric power.

3,660,697

MONOLITHIC SEMICONDUCTOR APPARATUS ADAPTED FOR SEQUENTIAL CHARGE TRANSFER

Carl Neil Berglund, Plainfield, and Harry Joseph Boll, Berkeley Heights, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Berkeley Heights, N.J.

Filed Feb. 16, 1970, Ser. No. 11,447
Int. Cl. H01l *17/00, 11/14*
U.S. Cl. 307—304 **8 Claims**



The invention is a form of monolithic semiconductor apparatus adapted for the storage and manipulation of elec-

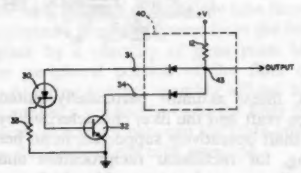
tronic signals representing information. Basically, the apparatus includes a plurality of spaced localized zones of one type semiconductivity adjacent the surface of a semiconductive bulk portion of the other type conductivity. A plurality of localized electrodes, registered in one-to-one correspondence with the localized zones, are disposed over a dielectric layer covering the semiconductive portions. Each of the electrodes is delimited in lateral extent so as to extend over substantially all of the space between a pair of closest zones and over a substantial portion of only one of that pair of zones so that the capacitance between the electrode and the zone over which it extends is substantially greater than the capacitance between that electrode and the other zone of that pair of zones. Signals in the form of varying deficiencies of majority carriers are stored temporarily in the localized zones and are gated sequentially from one zone to the zone next adjacent upon application of two-phase clock pulses to alternate electrodes. Constant background pulses upon which signals are superimposed are circulated to reduce distortion.

3,660,698

PHOTO-SCR CARD READER CIRCUITS

John C. Schisselbauer, Southampton, Pa., assignor to Peripheral Dynamics, Inc., Norristown, Pa.

Filed Feb. 3, 1970, Ser. No. 8,287
Int. Cl. G06k 7/10; H03k 3/42, 19/14
U.S. Cl. 307—311 **1 Claim**



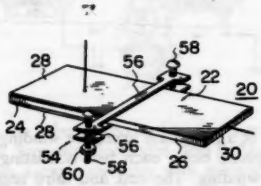
In a card reader compatible with electronic data processing equipment, electronic sensing circuits are disclosed which utilize photo-silicon controlled rectifiers in cooperation with logic circuitry. A photo-SCR rear sensor having binary memory is provided comprising a photo-SCR in series with one branch of a logic gate, with another branch connected to a reset pulse generator. An automatic reset sensor comprises a photo-SCR with its cathode in series with the base of a transistor, the anode of the photo-SCR being in series with a first branch of a logic gate and the collector of the transistor being in series with a second gate.

3,660,699

SUPPORTING MEANS FOR PIEZOELECTRIC TRANSFORMERS

Yasunobu Sakurai, Kawasaki; Hideo Sato; Masao Shimizu, both of Tokyo, and Keiji Inoue, Yokohama, all of Japan, assignors to Denki Onkyo Company, Limited, Tokyo, Japan

Filed July 29, 1970, Ser. No. 59,289
Claims priority, application Japan, Aug. 6, 1969, 44/61936; Sept. 9, 1969, 44/71149; Sept. 29, 1969, 44/92315
Int. Cl. H01v 7/00
U.S. Cl. 310—9.4 **5 Claims**



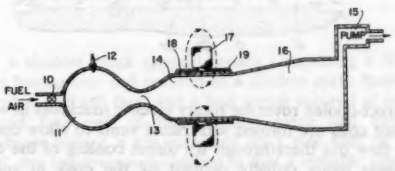
In a piezoelectric transformer comprising a ceramic body in the form of an elongate plate of piezoelectric material with one half polarized in the direction of thickness and the remaining half in the longitudinal direction, a pair of input electrodes secured to the opposite sides of said one half and an output electrode secured to the end surface of the remaining half, there is provided supporting means including means for mechanically clamping and supporting the piezoelectric transformer at at least one of the transverse line nodes of the longitudinal mechanical vibrational movement thereof which support permits free longitudinal vibrations while suppressing undesirable vibrating modes.

3,660,700

MAGNETOHYDRODYNAMIC GENERATOR

Sol Aisenberg, Natick, and Kuo Wei Chang, Lexington, both of Mass., assignors to Space Sciences Incorporated, Waltham, Mass.

Filed June 10, 1970, Ser. No. 44,973
Int. Cl. HO2n 4/02
U.S. Cl. 310—11 **5 Claims**



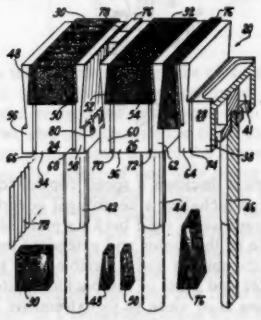
An electrodeless magnetohydrodynamic generator utilizes a stream of plasma pulses. The train of plasma pulses is caused to flow along an electrically insulated channel in the generator. Within the channel is established a magnetic field shaped to provide a component that is radial with respect to the longitudinal flow of the plasma. The plasma interacts with the shaped magnetic field to establish a pulsating magnetic field in the generator channel. A multi-turn coil is inductively coupled to the pulsating magnetic field and obtains AC power as the output of the generator.

3,660,701

COMPOSITE WALLS FOR MHD-GENERATOR DUCTS

Henri Blattmann, Igny; Jean Javellaud, Chilly-Mazarin, and David Yerouchaimi, Le Mesnil-Saint-Denis, all of France, assignors to Commissariat R L'nergie Atomique, Paris, France

Filed Mar. 18, 1971, Ser. No. 125,634
Claims priority, application France, Mar. 25, 1970, 7010732
Int. Cl. H02n 4/02
U.S. Cl. 310—11 **8 Claims**



The composite wall is constituted by an assembly of identical main elements each comprising at least one ceramic

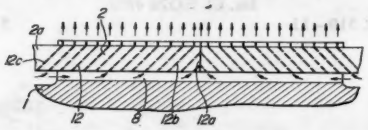
block which is fitted in a metallic support. The main elements are assembled together by means of trapezoidal prismatic spacer members which are fabricated from insulating refractory ceramic material and placed between corrugated stainless steel sheets which permit a circulation of coolant gas in contact with the main elements.

3,660,702

DIRECT-COOLED ROTOR FOR ROTARY ELECTRIC MACHINES

Tatsuo Kishino, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 4, 1971, Ser. No. 140,206
Claims priority, application Japan, May 11, 1970, 45/39319
Int. Cl. H02k *1/32*
U.S. Cl. 310—61 **4 Claims**



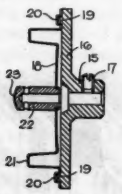
A direct-cooled rotor for rotary electric machines in which the rotor coils are formed with radial vents to allow cooling gas to flow out therethrough for direct cooling of the coils, said vents being radially defined by the coils in such a manner that in the axially central portions of the rotor body they extend uprightly outward and in the rest of the rotor body they extend inclinedly toward the central holes, some inclined vents adjacent each central hole communicating at one ends to said central hole in a herringbone pattern, so that the rotor can be evenly cooled across the lengths of coils set in the rotor body.

3,660,703

CENTRIFUGAL GOVERNOR SPEED CONTROL FOR ELECTRIC MOTORS

Philip Henry Evans, Stourbridge, England, assignor to Glenburn Engineering Limited, c/o Convers, Dill & Pearman, Bank of Bermuda Bldg., Hamilton, Bermuda

Filed June 29, 1970, Ser. No. 50,827
Claims priority, application Great Britain, July 4, 1969, 33724/69
Int. Cl. H02k *11/00*
U.S. Cl. 310—68 E **10 Claims**



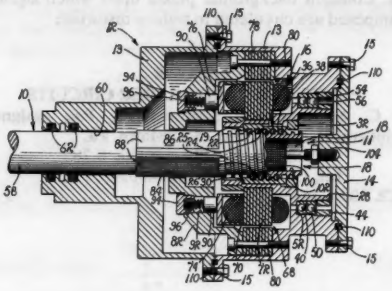
The specification discloses a speed control for an electric motor of the type including a centrifugal governor in which the governor comprises a rigid backing plate secured to the armature spindle of the motor and extending radially on opposite sides of the spindle and a flexible strip secured at its ends to the outer end parts of the backing plate and having weighted portions at or close to its extremities and an abutment part at its mid-point which engages means to open and close the contacts to the electric motor. The contacts may comprise a fixed contact and a movable contact, the movable contact being provided on the one arm of a two-armed lever which is pivotally mounted about an axis intermediate the two arms and the fixed contact member being mounted on a further arm pivoted about a further axis and adjustable in position relative to the movable contact by means of a manually operated cam to permit adjustment of the speed of the motor.

3,660,704

BALL-SCREW LINEAR ACTUATOR

Thomas O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Gerald S. Perkins, Altadena, Calif.

Filed July 31, 1970, Ser. No. 59,893
Int. Cl. H02k *7/06*
U.S. Cl. 310—80 **7 Claims**



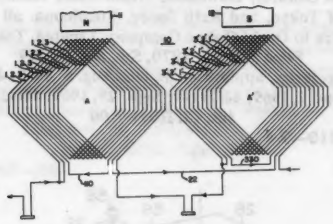
A compact, linear actuator particularly suited for use aboard a space craft and the like, characterized by an elongated output shaft operatively supported, in an hermetically sealed housing, for rectilinear reciprocation and circumscribed by a ball-screw and nut assembly which operatively is driven through an electrically energizable, reversible motor concentrically coupled with the nut of the ball-screw and nut assembly, whereby selected rectilinear motion is imparted to the shaft as the motor selectively is energized. A particular feature of the actuator resides in the concentricity of the nut and motor which enhances compactness of the actuator and the efficiency of its operation.

3,660,705

POLYPHASE GENERATOR WINDINGS

David M. Willyoung, Scotia, N.Y., assignor to General Electric Company

Filed Apr. 24, 1970, Ser. No. 31,496
Int. Cl. HO2k *3/00*
U.S. Cl. 310—198 **3 Claims**



Each phase of a polyphase armature winding is constituted by a pair of phase belts, each belt consisting of three segments of the winding. The first and third segments in each belt are connected in series with one another and the remaining segment is series-connected with a corresponding segment of the opposite phase belt. Each phase is thus con-

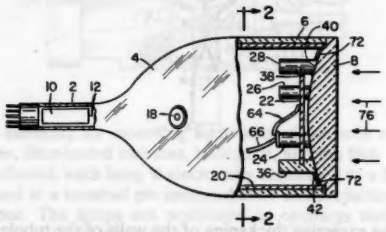
stituted by three separate circuits, but only a single connection ring per phase is necessary to connect segments laying on opposite sides of the armature.

3,660,706

MEANS FOR SECURING PLANAR MEMBER TO CATHODE RAY TUBE FACEPLATE

David R. Steinberg, and William T. Sutton, both of Raleigh, N.C., assignors to Corning Glass Works, Corning, N.Y.

Filed Nov. 16, 1970, Ser. No. 89,769
Int. Cl. H01j 29/02, 29/20, 31/08
U.S. Cl. 313—64 10 Claims



A planar member such as a phosphor coated fiber optic plate, having a thermal coefficient of expansion that is incompatible with that of a cathode ray tube faceplate, is accurately supported a precise distance from the inner surface of the faceplate by a plurality of glass posts having slots in which the peripheral portion of the fiber optic plate is disposed. A spring contact member affixed to at least one glass post applies a holding force to the fiber optic plate and makes electrical contact between the plate and a conductive coating on the inside of the tube envelope.

3,660,707

ELECTRON BEAM DISCHARGE DEVICE HAVING IMPROVED ELECTRON GUN STRUCTURE

Edward T. Rate, Jr., Owensboro, Ky., assignor to General Electric Company

Filed Jan. 15, 1970, Ser. No. 3,051
Int. Cl. H01j 29/74, 29/02
U.S. Cl. 313—80 1 Claim

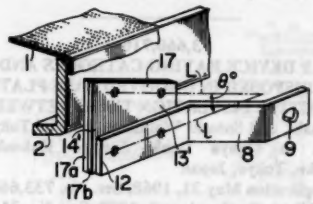
A cathode ray tube is provided having a gun comprising a cathode, grid, focusing electrodes, and deflection electrodes constructed as a cage assembly with mica spacers between the electrodes to insulate the electrodes from one another and to accurately position the gun in a constant diameter portion of the tube.

3,660,708

SHADOW MASK SUPPORT MEANS FOR A COLOR TELEVISION IMAGE TUBE

Hiroto Nakamura, Takatsuki; Ken-ichi Doi, Kobe; Akira Sato, Takatsuki, and Yushin Suziki, Amagasaki, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed Mar. 16, 1970, Ser. No. 19,945
Claims priority, application Japan, Mar. 19, 1969, 44/21834; 44/21833
Int. Cl. H01j 29/06, 29/02, 31/20
U.S. Cl. 313—85 S 2 Claims



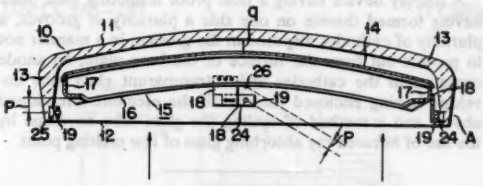
In a shadow mask support means comprising a bi-metal piece having one end secured to a shadow mask frame with the other end left free, and a leaf spring secured at one end to said free end of the bi-metal piece and extending therefrom toward a pin provided on a side wall of a face panel, the improvement residing in that a metallic plate portion disposed between said frame and said spring is so arranged that it is displaced due to thermal deflection of the bi-metal at the end adjacent to said pin by an amount smaller than the displacement at the opposite end.

3,660,709

COLOR TELEVISION TUBE HAVING SHADOW MASK SUPPORT STUDS UNEQUALLY SPACED FROM SCREEN

Hitoshi Imamura, Kanagawa-ken, and Keiji Katakura, Tokyo, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Dec. 8, 1970, Ser. No. 96,116
Claims priority, application Japan, Dec. 8, 1969, 44/115693
Int. Cl. H01j 29/02, 31/20
U.S. Cl. 313—85 S 6 Claims



The color television receiving tube of the present invention comprises a rectangular cylindrical panel having an outwardly curved rectangular face plate and two longer side plates and two shorter side plates so fitted to the periphery of the face plate as to project toward the funnel-shaped portion with the free flat edges of said side plates disposed in the same plane; a mask including a rectangular cylindrical frame member received in the cylindrical panel and formed of two longer side plates and two shorter side plates, of which at least said longer sides are outwardly curved at the top toward the face plate and a perforated member provided with numerous electron beam apertures and fixed to the cylindrical frame member at a prescribed space from the inner surface of the face plate; a plurality of support pins fixed in the inner wall of at least three of the adjacent projecting side plates of the cylindrical panel; and a plurality of elastic support mem-

bers elastically fitted to the side plates of the cylindrical frame member facing the corresponding support pins so as to be detachably engaged with said support pins, thereby maintaining the perforated member at a prescribed spacing from the inner wall of the face plate, wherein the support pins are positioned nearer to the free flat edges of the side plates of the cylindrical panel arranged in the same plane as compared with those edges of the side plates of the frame member which face said free flat edges, and the support pins embedded in the longer side plates of the cylindrical panel are more spaced from the plane defined by the free flat edges of all the side plates of the cylindrical panel than the pins fitted to the shorter side plates of said panel.

3,660,710

DISPLAY DEVICE HAVING CATHODES AND LEAD WIRES DISPOSED IN GROOVED BASE PLATE FOR POSITIVE INSULATION THEREBETWEEN

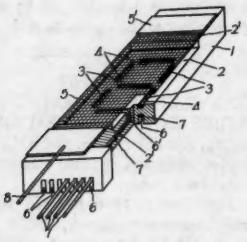
Kiyoshi Sasaki, and Satoshi Watanabe, both of Tokyo, Japan, assignors to Okaya Denki Sangyo Kabushikikaisha, Shibuya-ku, Tokyo, Japan

Original application May 31, 1968, Ser. No. 733,660. Divided and this application Apr. 1, 1970, Ser. No. 31,456

Claims priority, application Japan, Sept. 30, 1967, 42/83305

Int. Cl. H01j *61/66*

U.S. Cl. 313—109.5 **3 Claims**



A display device having a heat-proof insulating base plate having formed therein on one side a plurality of grooves, a plurality of cathodes disposed in the grooves in a manner not to project out from the surface of the base plate, an anode common to the cathodes and a transparent glass tube envelope having enclosed therein all the elements mentioned above, and a method of sealing the glass tube envelope by the use of infrared ray absorbing glass of low melting point.

3,660,711

XENON LAMP

Horace Edward Stanyon; Kenneth Buckley Robinson, and Eric John George Beeson, all of London, England, assignors to Thorn Lighting Limited, London, England

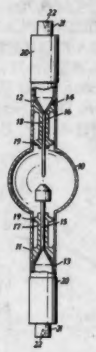
Filed Mar. 17, 1970, Ser. No. 20,173

Claims priority, application Great Britain, Mar. 19, 1969, 14,525/69

Int. Cl. H01j *61/36*

U.S. Cl. 313—220 **3 Claims**

A high pressure xenon discharge lamp whose envelope has tubular portions extending from an enlarged central portion, the ends of the tubular portions being sealed by internal metal shells closed at their inner ends, in which the electrode rods are embedded in glass stems whose outer ends are attached to the tubular portions of the envelope and whose inner ends are spaced from the tubular portions, allowing the tubular portions to be of sufficient diameter for the lamp to be supported from the ends of the tubular portions while



avoiding excessive thickening of the walls of the tubular portions.

3,660,712

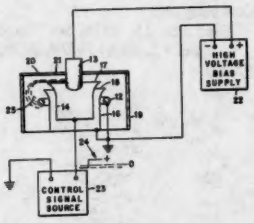
ELECTRODE STRUCTURE FOR CONTROLLING ELECTRON FLOW WITH HIGH TRANSMISSION EFFICIENCY

Lloyd Mancebo, Livermore, Calif., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Dec. 9, 1970, Ser. No. 96,416

Int. Cl. H01j *1/46, 21/10*

U.S. Cl. 313—307 **5 Claims**



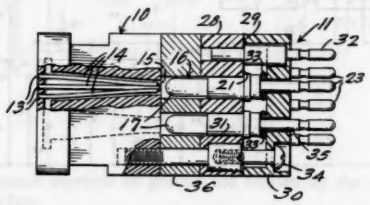
Electrode structure for controlling flow of electrons from a cathode to an anode, characterized by the absence of electrodes in the flow path whereby electron flow is substantially unimpeded by physical structure and proceeds with high transmission efficiency. The structure is such as to establish an electron accelerating field and associated flow path between cathode and anode which bulges outwardly about an interposed control electrode and is thus not physically intercepted by same. By virtue of the high efficiency of electron transmission, the electrode structure may be advantageously incorporated in an X-ray tube to provide X-ray pulses of increased intensity. In addition, the transmission characteristic in conjunction with the capability of the bulging field to enable the use of relatively small control voltages to govern electron flow render the electrode structure particularly well suited to the attainment of a high amplification factor in a high power amplifier tube for voltage regulation or switching applications.

3,660,713

LAMP ASSEMBLY HAVING TERMINAL PINS FOR ENGAGING EXTERNAL CIRCUIT CONNECTORS

Warren A. Leslie, and Rudolf Weinhart, both of Inglewood, Calif., assignors to Master Specialties Company, Costa Mesa, Calif.

Filed July 13, 1970, Ser. No. 54,166
Int. Cl. H01J 5/48, 5/50
U.S. Cl. 313—318 17 Claims



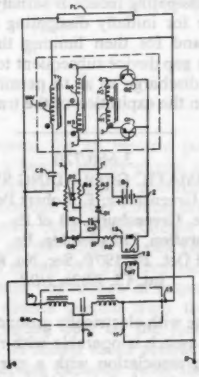
An assembly for mounting a plurality of lamps in readout devices, illuminated switches, indicators, and the like. In one embodiment, each lamp is electrically connected to a flanged base and to a terminal pin insulated from and projecting from the base. The lamps are positioned in openings through a conductor carrying lamp mounting plate. The lamp terminal pins, and a common terminal connected to the conductor on the mounting plate, project through openings in a base plate which is releasably attached to the mounting plate for changing the lamps. In a second embodiment, lamps having conventional flanged bases are positioned in openings in the mounting plate and headed terminal pins are mounted in the base plate such that the pin heads contact the lamps. In both embodiments, a plurality of elastomeric rings, one placed on each terminal pin, are compressed between the lamps, or the terminal pin heads, and the base plate to urge the lamp base flanges into electrical contact with the conductor on the lamp mounting plate. The terminal pin openings in the base plate are slightly enlarged so that the terminal pins can move to a small extent to align with an external circuit connector.

3,660,714

EMERGENCY LIGHTING SYSTEM

Edward A. Chandler, Bois des Filion, Quebec, Canada, assignor to Tenelux Limited, Bois des Filion, Province of Quebec, Canada

Filed Apr. 6, 1970, Ser. No. 25,879
Claims priority, application Canada, Apr. 8, 1969, 048,143
Int. Cl. H05b 41/14
U.S. Cl. 315—86 9 Claims



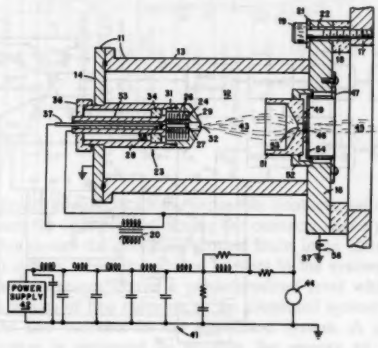
An emergency lighting system for electric discharge lamps utilizing an AC – DC inverter to supply emergency power and having a normally non-conductive switching element in the feedback circuit of the inverter upon failure of line power.

3,660,715

ION SOURCE WITH MOSAIC ION EXTRACTION MEANS

Richard F. Post, Walnut Creek, Calif., assignor to The United States of America as represented by the U.S. Atomic Energy Commission

Filed Aug. 18, 1970, Ser. No. 64,720
Int. Cl. H05h 1/00
U.S. Cl. 315—111 7 Claims



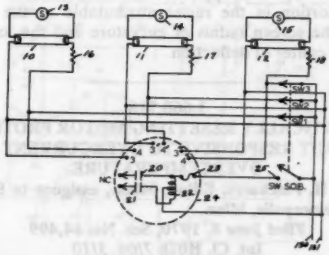
An ion source including means for producing a directed stream of ionized gas or plasma wherein a polycellular channeled mosaic element is positioned to transect the path traversed by the plasma so that a potential sheath is established in the plasma. The channel diameter is made less than the Debye length of the ions in the plasma wherefor the ions are accelerated out of the plasma, pass through the channels of the mosaic element and emerge as an ion beam on the other side of the matrix.

3,660,716

FLUORESCENT LIGHTING CIRCUIT

Fred B. Gorton, 7350 North Shore Drive, Erie, Pa.

Filed Sept. 24, 1969, Ser. No. 860,554
Int. Cl. H05b 37/00
U.S. Cl. 315—187 1 Claim



The specification discloses a circuit for starting a plurality of fluorescent lamps. The ordinary fluorescent lamp requires a heavy inductance, usually referred to as a ballast, for starting the lamps. The ballast is heavy and expensive. A lightweight resistance could be substituted for the ballast, if a simple means could be found to start the lamp. The present invention uses a single transformer to supply a higher voltage of, for example, 180 volts, for starting and a switching arrangement for switching the transformer from lamp to lamp.

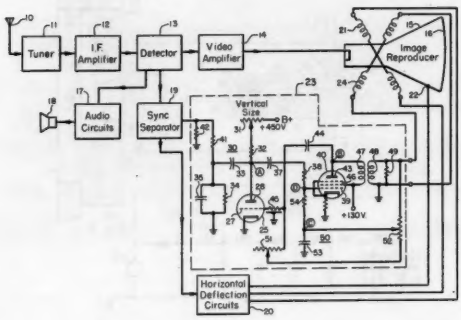
After the lamps are started they are switched onto a standard line voltage of 120 volts, for example. Thus, a single transformer is required to light a number of lamps.

3,660,717

TELEVISION DEFLECTION CIRCUIT FOR DISTORTION CORRECTION

Matthew J. Eltgroth, Elk Grove Village, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Nov. 3, 1969, Ser. No. 873,255
Int. Cl. H01j *29/70*
U.S. Cl. 315—27 GD **2 Claims**



A vertical deflection circuit for a television receiver that utilizes a flat face picture tube in which the radius of curvature of the face is greater than its distance from the deflection center of the scanning yoke. The circuit includes an oscillator and a first wave shaping network for developing a modified sawtooth sweep signal having a flattened trailing portion. A vertical output tube, in response to this modified signal, develops an output signal having a polarity opposite that of the input sawtooth. A feedback circuit couples the output signal to the input of the oscillator and also applies it to a second wave shaping network which includes an integrating circuit for deriving a signal having a parabolic component. The modified sawtooth and the parabolic component are combined to develop an S-shaped signal having modified slope portions at both extremities. The S-shaped signal is utilized as the control signal for the vertical output tube which supplies energizing currents, that are replicas of the S-shaped signal, to the deflection yoke thereby reducing the writing speed of the beam at opposite extremities of its scansion to offset distortion in the raster attributable to the disparity between the screen radius of curvature and the location of the yoke's center of deflection.

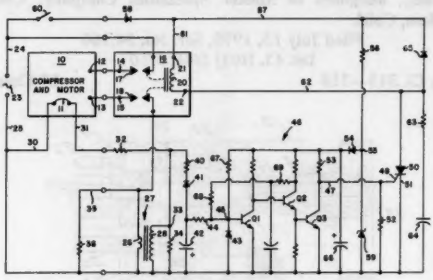
3,660,718

AUTOMATICALLY RESETTING MOTOR PROTECTION CIRCUIT RESPONSIVE TO OVERCURRENT AND OVERTEMPERATURE

Balthasar H. Pinckaers, Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed June 8, 1970, Ser. No. 44,499
Int. Cl. H02h *7/08, 3/10*
U.S. Cl. 317—13 B **9 Claims**

A protection system for hermetic compressors which senses the current being drawn by the compressor motor, and the condition of the motor as a function of a safety switch means which is enclosed within the system or motor. A locked rotor current overload causes immediate operation of the electronics to disconnect the motor from the line. A slowly rising unsafe condition, which is sensed by the opening of the safety switch means, also removes the motor from the line. The electronic circuitry has a time delay discharge network that prevents reclosing the electrical contactor until a



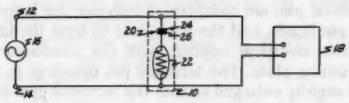
sufficient delay has existed for pressures in the compressor system to fall to a safe level.

3,660,719

TRANSIENT SUPPRESSION SYSTEM

Aime J. Grenier, North Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 26, 1970, Ser. No. 66,934
Int. Cl. H02h *3/22*
U.S. Cl. 317—16 **6 Claims**



An electrical protective system is disclosed for selectively shunting potentially harmful, temporary, high voltage electrical signals, such as transient signals, from a circuit being protected. The system includes a normally non-conductive, voltage breakdown device, such as a spark gap device, connected in shunt with the input of the circuit to be protected. In response to the occurrence of a transient signal of a preselected voltage level, the spark gap device is rendered conductive and an electrical arc is established thereacross in order to provide a shunt path for the transient signal. In addition, an energy dissipating means is serially connected to the spark gap device for initially dissipating the energy of the transient signal and for then limiting the current passing through the spark gap device subsequent to the establishment of the electrical discharge so as to permit rapid extinguishment thereof upon the expiration of the transient signal.

3,660,720

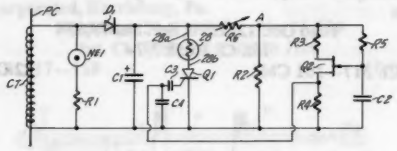
AUTOMATIC GROUNDING SWITCH

Ralph W. Samm, Greensburg; E. Robert Perry, Scottdale, and David S. Dodge, Greensburg, all of Pa., assignors to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed Oct. 20, 1970, Ser. No. 82,310
Int. Cl. H02h *3/08*
U.S. Cl. 317—16 **7 Claims**

Designed for use with electrically grounded power distribution systems, the switch is operable with replaceable propellent cartridges in association with a current limiting fuse. Upon receipt of an electrical signal indicating the presence of an overcurrent fault, a small surge of energy is provided to fire the cartridge and, in turn, propel its plunger into direct

contact with a "hot" terminal of the switch, establishing a conducting path to ground. The magnitude of the resulting



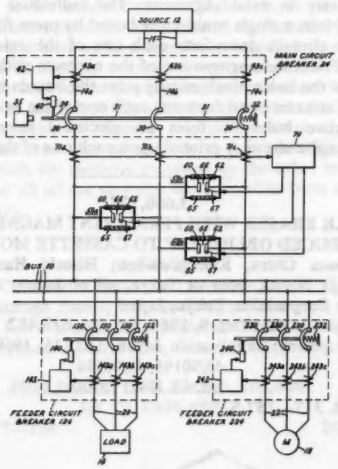
short circuit currents to ground are limited by the current limiting fuse.

3,660,721

PROTECTIVE EQUIPMENT FOR AN ALTERNATING CURRENT POWER DISTRIBUTION SYSTEM

Leslie L. Baird, Swarthmore, Pa., assignor to General Electric Company

Filed Feb. 1, 1971, Ser. No. 111,236
Int. Cl. H02h 3/08
U.S. Cl. 317—16 **8 Claims**



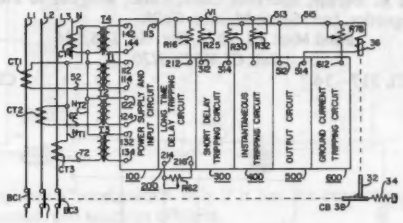
Protective equipment for an electric power distribution system comprising a bus, a supply circuit connected to the bus through a main circuit breaker, and feeder circuits connected to the bus through feeder circuit breakers. Should a high current fault occur on a feeder circuit, a short circuit is quickly established on the supply circuit on the bus side of the main breaker by means of a triggered vacuum gap device, which is triggered into conduction in response to the fault. This short circuit diverts current from the fault, thereby reducing the interrupting duty on the feeder breaker and enabling it to open on feeder faults producing fault current exceeding its interrupting capacity. After the feeder breaker has opened and before the main breaker can open, the triggered vacuum gap is returned to its normally non-conducting state, thus allowing power from the supply circuit to be restored to the bus.

3,660,722

CIRCUIT BREAKER INCLUDING IMPROVED GROUND FAULT PROTECTIVE DEVICE

John T. Wilson, Beaver, and Joseph C. Engel, Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 7, 1970, Ser. No. 35,516
Int. Cl. H01h 47/18
U.S. Cl. 317—18 R **12 Claims**



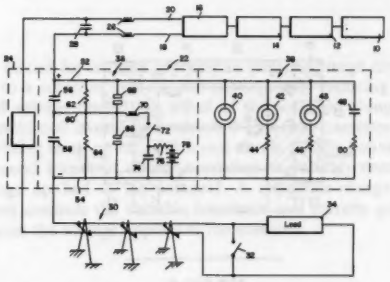
A circuit breaker including separable contacts, an operating means for opening and closing the contacts, and a protective relay device for detecting ground faults in an alternating current system when the ground current in the system being protected increases above a predetermined level which for certain values of line currents in the protected system varies with the line currents in the associated system. A current transformer is arranged to provide the energy or power necessary for the output of the device and also to provide a first signal which varies with the ground current in the system and other means is provided for deriving a second signal from the associated system which varies with the line current in the system for with the highest line current in the system with said protective device arranged to respond to both of said signals.

3,660,723

CURRENT TRANSFER CIRCUIT AS PART OF HIGH VOLTAGE DC CIRCUIT

Michael A. Lutz, Los Angeles, and Willis F. Long, Thousand Oaks, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 9, 1971, Ser. No. 122,395
Int. Cl. H02l 7/22
U.S. Cl. 317—11 C **16 Claims**



The current transfer circuit transfers current in a high voltage DC circuit breaker from an in-line switching device which carries the current in normal conduction to a shunt current interrupter which is capable of increasing the breaker impedance to break the high voltage DC circuit. The current transfer device employs first and second serially connected in-line switches, the first of which has a serially connected precharged capacitor, switch, and inductor paralleled therearound to force commutate the first in-line switch to

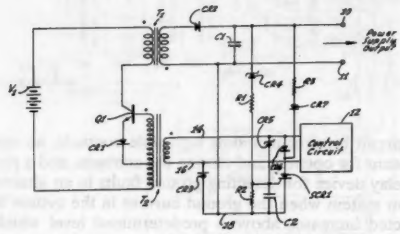
transfer current to the shunt current interrupter. The first switch and the forced commutation equipment need only be of sufficient voltage rating to withstand the initial conduction voltage across the shunt current interrupter. Opening of the second switch isolates the first switch and the forced commutation equipment from the line voltage.

3,660,724

POWER SUPPLY PROTECTIVE CONTROL

James K. Berger, Sherman Oaks, Calif., assignor to Pioneer Magnetics, Inc., Santa Monica, Calif.

Filed Mar. 18, 1971, Ser. No. 125,546
Int. Cl. H02h 3/20
U.S. Cl. 317—16 **3 Claims**



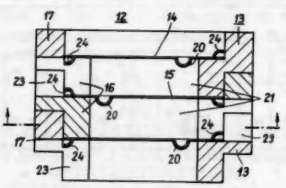
An improved protective circuit provided by which a silicon controlled rectifier (SCR), or equivalent device, is switched into circuit with a power supply in the presence of excessive output voltage, so as to protect the electronic equipment which is normally energized by the power supply. The protective circuit of the invention is such that the silicon controlled rectifier is not subjected to excessive currents so that it need not be excessively large, and no heat sink is required in conjunction with the silicon controlled rectifier.

3,660,725

OVERVOLTAGE ARRESTERS

Werner Jakszt, and Gert Schiele, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

Filed Sept. 4, 1970, Ser. No. 69,625
Claims priority, application Germany, Sept. 9, 1969, P 19 46 413.2
Int. Cl. H02h 9/06
U.S. Cl. 317—68 **5 Claims**



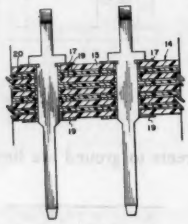
In an overvoltage arrester with an enclosed spark gap assembly of electrode disks and intermediate spacers of annular shape, at least one electrode of a pair has an excentrically located projection directed towards the other electrode of the pair and thereby defines in the ring space of the annular spacer a spot of initial response. The annular spacer has a lateral opening at a peripheral locality substantially opposite the excentric projection. The opening extends from the inner periphery through the spacer to the outer periphery thereof and has a small width in the peripheral direction as compared with the total extent of the periphery.

3,660,726

MULTI-LAYER PRINTED CIRCUIT BOARD AND METHOD OF MANUFACTURE

John Preston Ammon, Dallas, Tex., and Frederick T. Inacker, Huntington Valley, both of Pa., assignors to Elfab Corporation

Filed Oct. 12, 1970, Ser. No. 79,854
Int. Cl. H05k 1/14
U.S. Cl. 317—101 CM **22 Claims**



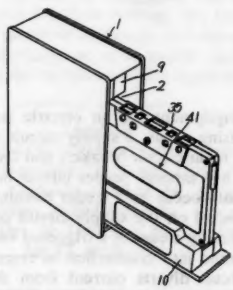
A multi-layer printed circuit board is constructed by sandwiching a thin insulating sheet between adjacent ones of a plurality of double-sided printed circuit boards. Each of the individual boards is formed with conventional plated-through holes electrically connecting the printed circuitry on opposite sides of the boards. The holes are located on the boards so that when the boards are stacked the holes on adjacent boards are in axial alignment. The individual boards are formed into a single multi-layer board by press fitting a conductive contact down into each one of the axially aligned holes. Frictional engagement of the contacts with the plated walls of the holes mechanically joins the boards into a single unitary structure and connects each one of the axially aligned conductive holes to form an electrical interconnection between the circuitry printed upon each one of the boards.

3,660,727

BULK ERASER WITH PERMANENT MAGNET FLUX PRODUCED OBLIQUELY TO CASSETTE MOVEMENT

Shigemasa Ohira, Kanagawa-ken; Hisoshi Hanzawa, and Hisaya Narita, both of Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 9, 1969, Ser. No. 870,482
Claims priority, application Japan, Oct. 16, 1968, 43/75398; 43/90195; 43/90196
Int. Cl. H01f 13/00
U.S. Cl. 317—157.5 **7 Claims**



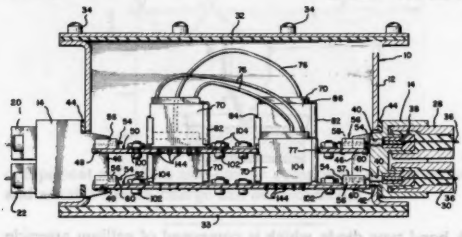
A bulk eraser for a recorded magnetic medium, the eraser consisting of a housing having a passage for the recorded magnetic medium and magnet means arranged adjacent said passage.

3,660,728

APPARATUS FOR SELECTIVELY INTERCONNECTING THE CONDUCTORS OF A PLURALITY OF MULTI-CONDUCTOR CABLES

Clyde Thomas Carter, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sept. 30, 1970, Ser. No. 76,720
Int. Cl. H05k 7/10; H02b 1/20
U.S. Cl. 317—118 18 Claims



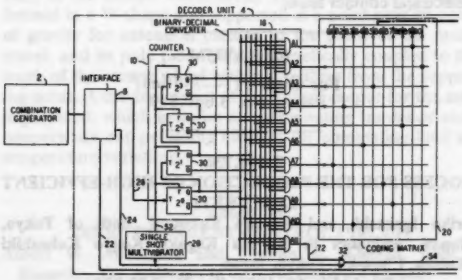
A system for selectively interconnecting the conductors of a plurality of multi-conductor cables, comprising a pair of printed circuit boards disposed in substantially parallel, spaced apart relationship, one side of each of the boards having conductors thereon which extend to the edge portions thereof. The multi-conductor cables have connectors on the ends thereof which are connected to the edge portions of the boards so that the conductors in the cables are electrically connected to the conductors on the boards. A plurality of terminal junction modules are mounted on the other sides of the boards and have contact terminals extending through the boards and electrically connected to the conductors on the boards. Interconnection conductors having contact terminals on their ends are selectively mated with the terminals of the junction modules to thereby selectively interconnect the cable conductors. One of the boards has openings therein through which the modules mounted on the other board extend so that all of the modules are accessible from one side of the boards.

3,660,729

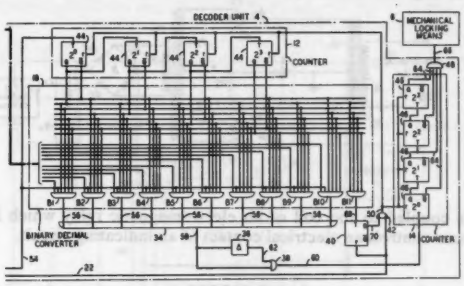
ELECTRONIC COMBINATION LOCK SYSTEM

Charles Fitzhugh James; Ralston Hodges Robertson, Jr., and Merville Lee Warnock, all of Indianapolis, Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 11, 1971, Ser. No. 105,406
Int. Cl. E05b 49/00
U.S. Cl. 317—134 24 Claims



An electronic combination lock system comprises a decoder unit having a built-in combination. An external combination generator transmits a combination into the decoder unit to energize a lock operating means which operates a locking bar to lock or unlock the enclosure. The decoder recognizes a combination only if it has the correct number, sequence, and spacings of digits.

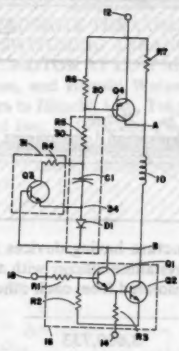


3,660,730

SOLENOID DRIVE CIRCUIT

Edwin E. Mason, Harrisburg, Ohio, assignor to Design Elements Inc.

Filed Dec. 16, 1970, Ser. No. 98,627
Int. Cl. H01h 47/32, 47/04
U.S. Cl. 317—148.5 10 Claims



A circuit for initially applying an unusually large drive voltage to a solenoid coil and for subsequently reducing the applied voltage during the travel of the solenoid plunger. The solenoid coil is serially connected to a first transistor circuit operating as an on-off switch and also is serially connected to a second transistor circuit operating to variably control the voltage applied to the solenoid. A capacitor-charge timing circuit controls the variable transistor and thereby gradually reduces the voltage applied to the solenoid.

3,660,731

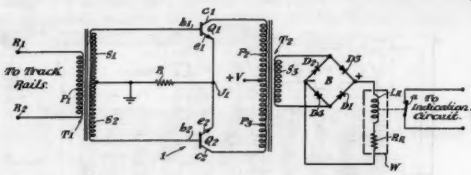
FAIL-SAFE PULSATING PEAK DETECTION CIRCUIT

John O. G. Darrow, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Feb. 18, 1970, Ser. No. 12,297
Int. Cl. H01h 47/32
U.S. Cl. 317—148.5 R 15 Claims

This disclosure relates to a fail-safe peak detector for detecting the presence of pulsating input signals and for providing an output signal which is proportional to the peak values of the input signals. The detector includes an amplifier hav-

ing its input transformer coupled to the input signals and having its output transformer coupled to a bridge rectifier which



is coupled to the coil of an electromagnetic relay which in turn controls an electrical contact of an indicating circuit.

3,660,732

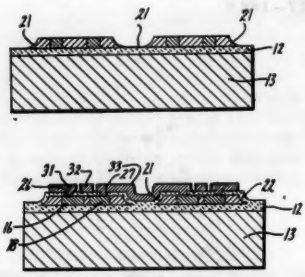
SEMICONDUCTOR STRUCTURE WITH DIELECTRIC AND AIR ISOLATION AND METHOD

David Frank Allison, Los Altos, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Continuation of application Ser. No. 776,427, Nov. 18, 1968, now abandoned. This application Feb. 8, 1971, Ser. No. 113,628

Int. Cl. H01l *3/00, 5/00*

U.S. Cl. 317—234 R **7 Claims**



Semiconductor structure having devices formed in a very thin layer of monocrystalline silicon with the devices being dielectrically and air isolated from each other.

3,660,733

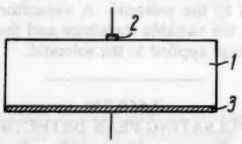
HOMOGENEOUS SEMICONDUCTOR WITH INTERRELATED ANTIBARRIER CONTACTS

Fernando Zhozevich Vilf, Istrinskaya ulitsa 5 korpus 2, kv. 9, and Alexandr Pavlovich Lysenko, Khoroshevskoe shosse 5 korpus 6, kv. 10, both of Moscow, U.S.S.R.

Filed Oct. 29, 1969, Ser. No. 872,291

Int. Cl. H01l *5/02*

U.S. Cl. 317—234 **6 Claims**



A semiconductor device comprising a homogeneous semiconductor crystal and two antibarrier contacts, the area of one of which is smaller than that of the other and the diameter is smaller than the distance between the contacts and is limited in absolute value lying within 1 to 100 microns. This device can perform various functions, such as an oscillator, or a currector or a switch.

3,660,734

BOND TYPE DIODE UTILIZING TIN-DOPED GALLIUM ARSENIDE

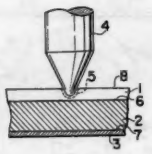
Shinya Iida, Hino-shi; Hitoshi Sato, Nishitama-gun, and Yutaka Takeda, Nakano-ku, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sept. 9, 1969, Ser. No. 856,451

Claims priority, application Japan, Sept. 9, 1968, 43/64258

Int. Cl. H01l *11/00, 15/00*

U.S. Cl. 317—235 R **7 Claims**



A bond type diode which is composed of gallium arsenide doped with tin within the range of 1×10^{16} to 5×10^{17} atoms/cm^3, preferably about 3×10^{17} atoms/cm^3, of a gold wire containing zinc welded onto a portion of a surface of the tin-doped gallium arsenide, and of an electrode in ohmic contact with the tin-doped gallium arsenide at a portion different from the welded portion.

3,660,735

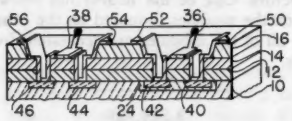
COMPLEMENTARY METAL INSULATOR SILICON TRANSISTOR PAIRS

John D. McDougall, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Sept. 10, 1969, Ser. No. 856,747

Int. Cl. H01l *19/00*

U.S. Cl. 317—235 R **3 Claims**



A complementary metal-insulator-silicon transistor pair of the field effect type with self-registered gates is produced by introducing doped regions into limited areas of a semiconductive body by ion beam implantation through insulative films overlying the surface of the semiconductor, followed by temperature annealing in order to repair radiation damage caused by the ion beam implantation. Ion bombardment enhanced etching of a Si_3N_4 layer is used to simplify opening of electrical contact areas.

ERRATUM

For Class 317—735 see:
Patent No. 3,660,819

3,660,736

PROCESS FOR THE PRODUCTION OF HIGH-EFFICIENT ELECTRETS

Yuriko Igarashi, and Haruko Kakutani, both of Tokyo, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Chuo-ku, Tokyo, Japan

Filed Mar. 10, 1971, Ser. No. 122,870

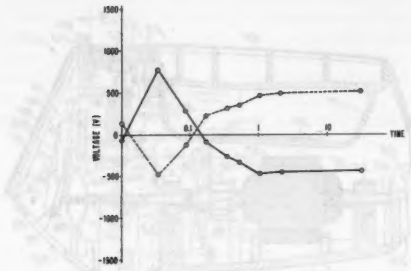
Claims priority, application Japan, Mar. 10, 1970, 45/19723

Int. Cl. H01g *7/02*

U.S. Cl. 317—262 F **5 Claims**

By heat-treating a polymer-type electret that has been subjected to a polarization treatment at temperatures lower than

the melting point of the polymer but higher than the glass transition point of the polymer, an unstable hetero-charge



component and the homo-charge component can be reduced and a stable hetero-charge can be sustained.

3,660,737

MAGNETIC ESCAPEMENT

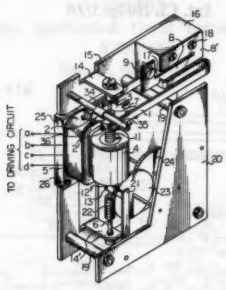
Satoshi Sakai, Hirakata; Kenzo Shirakawa, and Norio Shimizu, both of Neyagawa, all of Japan, assignors to Matsushita Electric Works, Limited, Osaka, Japan

Filed Oct. 27, 1970, Ser. No. 84,324

Claims priority, application Japan, Nov. 15, 1969, 44/108697; Nov. 18, 1969, 44/92339; Nov. 21, 1969, 44/93753

Int. Cl. H02k *29/00*

U.S. Cl. 318—138 **6 Claims**



A magnetic escapement including a rotor driven by an external force, and escape wheel made of a magnetic material and having along its periphery radially extending magnetic teeth, said escape wheel being coupled through a coil spring to the rotor, and an oscillator having a magnetic pole piece secured at the end of one of its tines and coupled magnetically to the escape wheel teeth. The oscillator is preferably formed in a W-shape and supported at a point near its center of gravity for extension parallel to the plane of the escape wheel, and its pole piece being magnetically coupled to that tooth of the escape wheel which is farthest from the supporting point. A driving circuit of a constant output for the rotor is provided, which includes a compensating transistor and a temperature compensating element for eliminating load and temperature variations.

3,660,738

DIRECT CURRENT CONTROL CIRCUIT

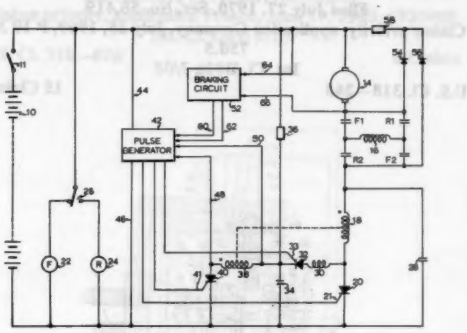
Albert W. Anderson, and Charles E. Konrad, both of Roanoke, Va., assignors to General Electric Company

Filed Sept. 21, 1970, Ser. No. 73,741

Int. Cl. H02p *29/02*

U.S. Cl. 318—138 **19 Claims**

A control circuit for controlling the effective power to a load from a power source of substantially constant direct current voltage includes a first or main solid state switching device for placing the load and the power source in series. Suitable circuitry including a commutating capacitor chargable in a direction such that its discharge will terminate conduction of the main switching device further includes re-



sistive means serving to maintain the capacitor in constant communication with the power source. Also provided is a means for providing dynamic braking of a direct current motor load through a resistive element such that the armature terminal voltage is adjusted linearly with the speed thereof.

3,660,739

MEANS TO PROMOTE THE COMMUTATION OF A THYRISTOR SWITCHING ARRANGEMENT FOR AN ELECTRIC MOTOR AT LOW MOTOR SPEEDS

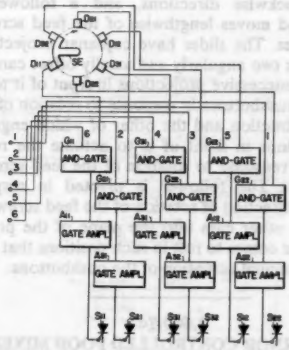
Toshiaki Okuyama, and Hiroshi Watanabe, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 8, 1970, Ser. No. 96,169

Claims priority, application Japan, Dec. 8, 1969, 44/97872

Int. Cl. H02p *5/40*

U.S. Cl. 318—227 **12 Claims**



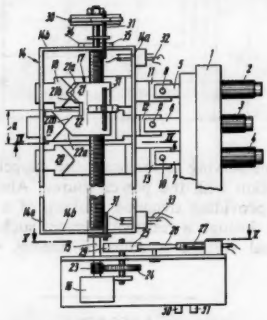
An electric motor system consisting of switching means, such as an inverter, and a synchronous motor, means to promote the commutation action of the switching means at starting, comprising two polyphase windings mounted on the stator of the synchronous motor with magnetic coupling, one of the polyphase windings being connected to produce the rotating magnetic field with the direct current source through the switching means and the other polyphase winding being energized by an external alternating current source in order to supply commutating energy to the switching means.

3,660,740

DEVICE FOR REMOTE-CONTROL OPERATION OF KNOBS IN TELEVISION RECEIVERS OR THE LIKE

Gerhard Rossteutscher, Villingen, Germany, assignor to Saba Schwarzwalder Apparate-Bau-Anstalt, August Schwer Sohne GmbH, Villingen, Germany

Filed July 27, 1970, Ser. No. 58,419
Claims priority, application Germany, July 25, 1969, P 19 37 750.5
Int. Cl. H02p 3/08
U.S. Cl. 318—265 15 Claims



A device for actuating by remote control a row of pushbuttons in a television or radio receiver wherein a mechanism automatically releases a previously actuated pushbutton in response to actuation of another pushbutton. The device has a series of parallel slides each coupled to one of the pushbuttons, a feed screw which can be driven stepwise in clockwise and counterclockwise directions, and a follower which meshes with and moves lengthwise of the feed screw when the latter rotates. The slides have coplanar projections and the follower has two angularly and axially offset cams one of which engages successive projections in front of it to actuate the respective pushbuttons in response to rotation of the feed screw in one direction and the other of which engages successive projections in front of it to actuate the respective pushbuttons in response to rotation of the feed screw in the other direction. The follower is pivoted in response to changes in the direction of rotation of the feed screw to place the one or the other cam into the plane of the projections and the follower comes to rest in such positions that it cannot interfere with manual actuation of the pushbuttons.

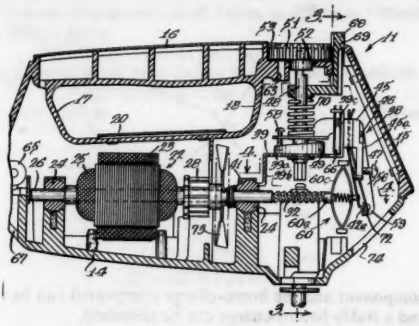
3,660,741

GOVERNOR CONTROLLED FOOD MIXER

John Walter, Evergreen Park, Ill., assignor to Sunbeam Corporation, Chicago, Ill.

Filed June 17, 1970, Ser. No. 47,003
Int. Cl. B01f 7/16
U.S. Cl. 318—325 12 Claims

A lightweight, hand operated food mixer having a speed control which includes a mechanical governor for controlling the motor to any preselected speed. The speed control includes a manually operable cam and a switch which are mounted on a frame above the worm drive to the beater spindles. The switch, which includes a pair of starting contacts and governor controlled contacts, extends downwardly into proximity with the centrifugal element which is mounted on the forward end of the motor shaft. A beater ejector is



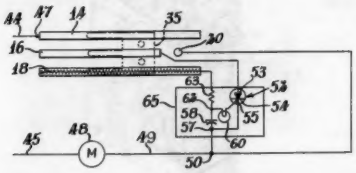
mounted for reciprocating movement by the speed control shaft and straddles the cam for controlling the governor.

3,660,742

TRIGGER OPERATED SPEED CONTROL ASSEMBLY FOR ELECTRIC MOTORS

Alex F. Gawron, Chicago, Ill., assignor to Skil Corporation, Chicago, Ill.

Continuation of application Ser. No. 438,627, Mar. 10, 1965, now abandoned. This application June 24, 1970, Ser. No. 49,217
Int. Cl. H02p 5/16
U.S. Cl. 318—345 2 Claims



A trigger operated switch includes three contact strips and a bypass contact button. The trigger carries three slides for respective sliding engagement with such strips. Two of the strips are adapted for connection with a speed control circuit, one strip cooperating with one slide to define a variable resistor of such circuit. When the trigger is fully depressed, one of the slides is in engagement with the contact button for bypassing the speed control circuit.

3,660,743

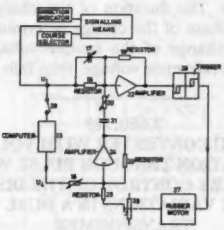
ELECTRICAL AUTOMATIC PILOT

Walter Kundler, and Gerd Hingst, both of Kiel, Kiel-Ellerbek, Germany, assignors to Anschutz & Co., G.m.b.H., Kiel-Wik, Germany

Filed Oct. 6, 1970, Ser. No. 78,497
Int. Cl. G05d 1/00; B63h 25/02
U.S. Cl. 318—588 4 Claims

The invention relates to an automatic pilot for a rudder-controlled ship of the type in which the motor-operable steering gear for actuating the rudder of the vehicle is controlled by a trigger circuit which in its turn is controlled by an operational circuit including a PID-network. Some ships have a tendency to break out of their course when the rudder is in the midship-position. It is the object of the invention to provide the pilot with additional means for overcoming this tendency by such a control of the trigger circuit that the

rudder is displayed by an angle in excess of that produced by said operational circuit thereby exerting a stabilizing moment



on the ship. The additional means comprises an electronic computer having an input receiving the error signal and an output connected to the trigger circuit.

3,660,744

SERVO CONTROL SYSTEMS

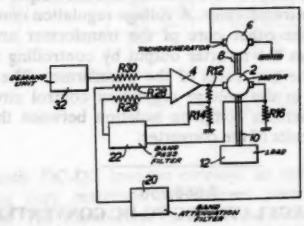
Dexter Robert Plummer, Leicester, England, assignor to The Rank Organization Limited, London, England

Continuation of application Ser. No. 797,560, Feb. 7, 1969, now abandoned. This application Jan. 11, 1971, Ser. No. 105,703

Claims priority, application Great Britain, Feb. 22, 1968, 8,733/68

Int. Cl. G05b *5/01*

U.S. Cl. 318—616 **7 Claims**



A servo control system comprises an actuator such as an electric motor which is operated in response to a demand signal and to a feedback signal representative of the actual actuator response. The feedback signal is derived by way of respective filters from two component signals representative of the actual response of the actuator and derived respectively from a transducer such as a tachometer generator coupled directly to the actuator and from the actuator itself. The filters are arranged so that the feedback signal contains a greater proportion of the component signal from the actuator within any frequency ranges in which mechanical resonance occurs in the system and a greater proportion of the component signal from the transducer within frequency ranges devoid of such mechanical resonance, so that the component signals substantially compensate each other at resonance and the resulting feedback signal is substantially free of resonance components.

3,660,745

DEVICE FOR ADJUSTING THE MEASUREMENT RANGE OF CAPTORS FITTED WITH FORCE BALANCES PARTICULARLY FOR PRESSURE CONVEYORS

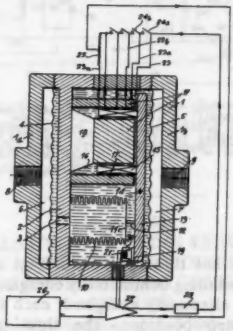
Pierre Claude Bertrand, Pau-Billere, France, assignor to Compagnie Des Compteurs, Paris, France

Filed June 5, 1970, Ser. No. 43,849

Claims priority, application France, June 19, 1969, 6920508

Int. Cl. G01l *9/10*

U.S. Cl. 318—676 **6 Claims**



The device comprises a force balance including several windings, switches being provided for selective connection of any of the windings in the circuit of the force balance to compensate for different ranges of measurement.

3,660,746

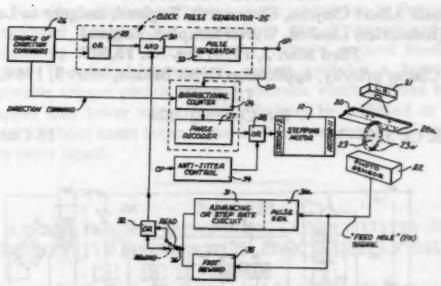
STEPPING MOTOR DAMPING SYSTEM

Donald L. Milek, Seal Beach, Calif., assignor to Ex-Cello-O Corporation, Detroit, Mich.

Filed June 9, 1970, Ser. No. 45,172

Int. Cl. H02k *37/00*

U.S. Cl. 318—696 **11 Claims**

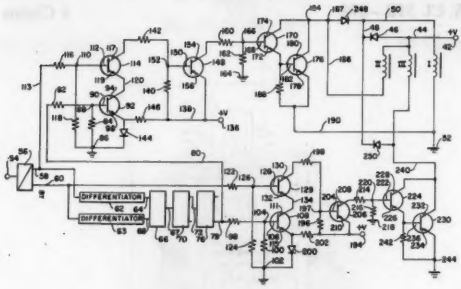


Method and apparatus for electronically damping a stepping motor to prevent the rotor from oscillating in advancing from position to position. The electronic damping includes digital circuits constructed and defined for advancing the rotor from position to position and while advancing, energizing all of the stator windings for a time interval less than the time period required to advance the rotor from position to position and yet of sufficient time duration to prevent the rotor from hunting when it arrives at its new position.

3,660,747
STEP MOTOR AND CONTROL CIRCUIT THEREFOR

Clifford W. Kruer, and John R. Frazier, both of Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed Aug. 27, 1970, Ser. No. 67,403
Int. Cl. H02k 37/00
U.S. Cl. 318—696 4 Claims

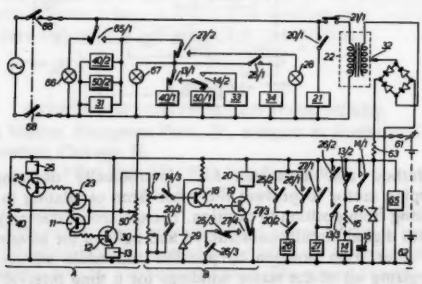


A step motor has three phase windings and is operated with one phase winding continuously energized and the other phase windings alternately energized, each to select one of two possible step positions. The three phase windings separately develop flux between pole portions of the stator and a rotor responsive to the magnetic flux in the stator pole portions moves between two positions of least reluctance as the second and third windings are alternately energized. By means of associated control circuits, each of the second and third windings, when de-energized, is permitted to dissipate its back e.m.f. through the first winding to momentarily increase the magnetic flux developed with said first winding. Accurate step positioning without overshoot and without detent means is achieved by a timed interruption in the energization of whichever of the second and third windings is initiating a shift in the rotor position, the arrangement of stator windings being such that upon re-energization of the step initiating phase the flux developed by the step initiating phase will operate to arrest rotor movement.

3,660,748
BATTERY CHARGING CURRENT AND TERMINATION CONTROL CIRCUITRY

Dennis Albert Clayton, Gawsworth, England, assignor to Legg (Industries) Limited, Wolverhampton, England

Filed Mar. 2, 1970, Ser. No. 15,627
Claims priority, application Great Britain, Mar. 3, 1969, 1,160/69
Int. Cl. H02j 7/04
U.S. Cl. 320—39 29 Claims

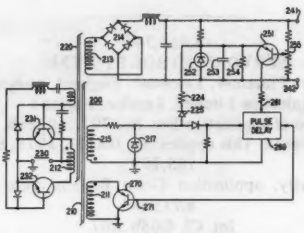


To reduce the charging current in the latter part of a charge, an automatic battery-charging apparatus includes means for comparing a sample voltage depending on the battery voltage while on charge, with a reference voltage which is progressively increased throughout the charge, and using a function of the difference to control the charging current. Thus if the battery voltage and sample voltage increase more rapidly than the reference voltage, the charging current is reduced and vice versa. The reference voltage may be supplied by a motor-driven potentiometer, or by a progressivley charged capacitor. The duration of the charge is also controlled so that a phase of the charge is terminated when the value or rate of change of the sample voltage, having exceeded that of the reference voltage, then falls below it.

3,660,749
DC TO DC CONVERTER WITH VOLTAGE REGULATION THROUGH PULSE WIDTH MODULATION BY CONTROL OF THE DISTRIBUTION OF FLUX VARIATIONS IN A DUAL CORE TRANSFORMER

Fred Vassaf Kadri, Madison, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 25, 1971, Ser. No. 127,923
Int. Cl. H02m 3/22
U.S. Cl. 321—2 7 Claims



A DC to DC converter regulates its voltage output by controlling the distribution of flux variations in a dual core transformer included in the converter's inverter circuit. The inverter output is coupled to a rectifier and the output load, via one core of the transformer. A voltage regulation control circuit includes the other core of the transformer and pulse width modulates the inverter output by controlling the flux variations in the two cores of the transformer. The second core included in the voltage regulation control circuit advantageously permits complete isolation between the input and output circuits of the converter.

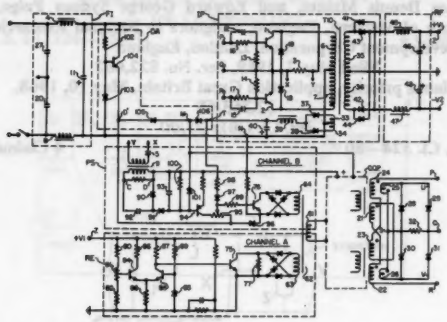
3,660,750
SELF-REGULATED DC TO DC CONVERTER

Pietro Businelli, Milan, Italy, assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 7, 1970, Ser. No. 95,675
Claims priority, application Italy, Mar. 25, 1970, 22408
Int. Cl. H02m 3/28
U.S. Cl. 321—2 9 Claims

A regulated power supply using square wave generator the pulse width of which is governed by an impedance controlled by the converter output. The impedance is impressed on the square wave generator through an insulating transformer with two separate secondary windings, one connected to the diode bridge output of an output voltage error detector and the other connected to the diode bridge output of an overcurrent and overvoltage protecting device; in this manner physical isolation is provided between the error detector, as well as the protecting device, and the square wave generator and thus between the output and input of the power supply. The square wave generator output operates on the control input of a separate power inverter which is also used to provide a regulated, but isolated, output for normally powering

the square wave generator. Initially the square wave generator is powdered by a preregulator associated with the DC input to the converter. In addition to the conventional output



pulses the square wave generator also furnishes quenching pulses to minimize the switching losses in the switching transistors of the power inverter.

3,660,751

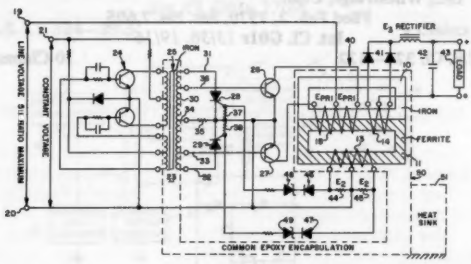
DC-DC REGULATED INVERTER EMPLOYING PULSE-WIDTH MODULATION WITH A CONSTANT VOLT-SECOND SENSING TRANSFORMER

Johannes Bullinga, Cedar Rapids, Iowa, assignor to Collins Radio Company, Cedar Rapids, Iowa

Filed Mar. 29, 1971, Ser. No. 128,748

Int. Cl. H02m *3/32*

U.S. Cl. 321—2 **6 Claims**



A static DC-DC inverter employs an output transformer utilizing core materials of different permeability characteristics. The transformer establishes a constant volt-second product as concerns the output waveform and establishes self-regulation on an open loop basis with inherent preventatives as concerns excessive output current spike generation.

3,660,752

PHOTOELECTRIC VOLTAGE REGULATOR ARRANGEMENT

Peter Pfeffer, Lauffen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

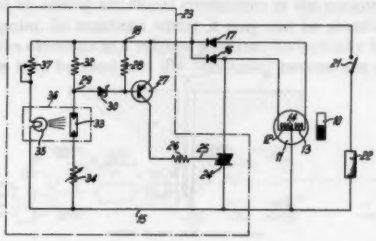
Filed Mar. 13, 1970, Ser. No. 19,280

Claims priority, application Germany, Mar. 19, 1969, P 19 13 809.1

Int. Cl. H02p *9/00*

U.S. Cl. 322—26 **8 Claims**

A permanent magnet alternating current generator has an incandescent bulb connected across the full-wave rectifier which furnishes a D.C. current to a load. The incandescent bulb varies the resistance of the photo resistor. A sufficient change in the resistance of the photo resistor causes the conduction of a transistor which in turn causes conduction of a triac which is connected in parallel with one of the two series connected output windings of the generator. When the triac



becomes conductive, it short circuits the winding, lowering the output voltage, thus in turn causing the incandescent lamp to emit less light, varying the photo resistance to block the transistor and open the triac.

3,660,753

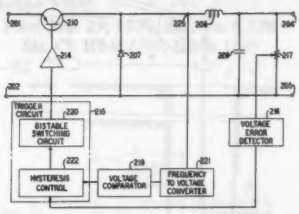
SELF-OSCILLATING SWITCHING REGULATOR WITH FREQUENCY REGULATION THROUGH HYSTERETIC CONTROL OF THE SWITCHING CONTROL TRIGGER CIRCUIT

Frank Fuller Judd, Madison; Jan Mark Lieberman, Lake Hiawatha, and Helmut Wilhart, Whippany, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 21, 1970, Ser. No. 100,148

Int. Cl. G05f *1/56*

U.S. Cl. 323—22 T **6 Claims**



A self-oscillating switching mode regulator is frequency regulated by directly controlling the hysteresis of the switching control circuit in the voltage control feedback loop. The switching control circuit includes a hysteretic bistable trigger circuit whose hysteresis width defined by its upper and lower triggering levels may be widened or narrowed about some mean signal level in response to a frequency error signal.

3,660,754

APPARATUS FOR MEASURING CONDUCTIVITY IN A DISSIPATIVE MEDIUM WITH ELECTRICALLY SHORT PROBES

Carson K. H. Tsao, Braintree, and Joseph T. De Bettencourt, West Newton, both of Mass., assignors to Raytheon Company, Lexington, Mass.

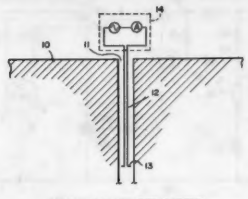
Continuation of application Ser. No. 748,814, July 30, 1968, now abandoned. This application June 11, 1970, Ser. No. 48,837

Int. Cl. G01v *3/08, 3/18*

U.S. Cl. 324—5 **9 Claims**

An apparatus for measuring conductivity in a dissipative medium with electrically short probes uses a signal source of wavelength λ. The apparatus further includes a dipole antenna probe of electrical length *l* less than λ/2, and a transmis-

sion line. The line intercouples the dipole antenna probe to the signal source. The conductivity of the dipole as reflected



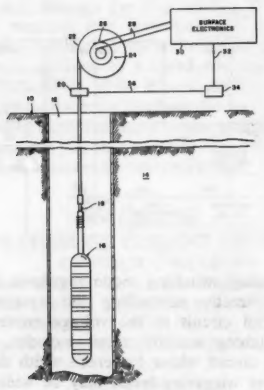
back through the transmission line most nearly approximates a point measurement of conductivity in the immediate region surrounding the probe.

3,660,755

DUAL FOCUSED LOG HAVING ALTERNATELY ENERGIZED FOCUSING APPARATUS THEREIN

Herman W. Janssen, Kiel, Germany, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 7, 1969, Ser. No. 874,748
Int. Cl. G01v *3/18*
U.S. Cl. 324—10 **6 Claims**



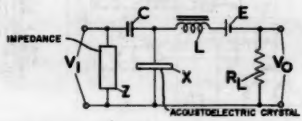
Methods and apparatus for simultaneously obtaining two focused logs of formation resistivity with different depths of investigation. A pair of nearby focusing current return electrodes is added to the subsurface apparatus of a conventional focused logging system and a second focusing current supply is added to the surface instrumentation. The preferred embodiment uses commutator devices to effect, alternately and repetitively, two different interconnections of the subsurface electrodes with the surface equipment whereby two logs are recorded on a single traverse of the borehole by the subsurface instrument. The two logs are combined to obtain a compensated focused current log representing improved measurements of the true resistivities of the formations. All subsurface elements of one focused logging system, except its focusing current return electrode, are time-shared with the other focused logging system.

3,660,756

FREQUENCY SENSITIVE DETECTING AND MEASURING CIRCUITS BASED ON THE ACOUSTIC ELECTRIC EFFECT

James Dennis Maines, and Edward George Sydney Paige, both of Malvern, England, assignors to National Research Development Corporation, London, England

Filed May 7, 1969, Ser. No. 822,682
Claims priority, application Great Britain, May 10, 1968, 22,263/68
Int. Cl. G01r *23/00*
U.S. Cl. 324—80 **4 Claims**



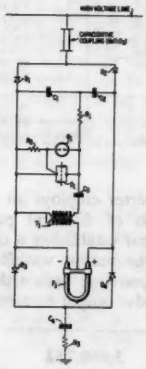
A detector consists of an acousto-electric oscillator biased above cut-off for spontaneous acousto-electric oscillations and stimulates into acousto-electric oscillations by the a.c. signal to be detected. Alternatively the power supply to an acousto-electric oscillator may be pulsed, in which case the time delay between the beginning of the pulse and the build-up of significant acousto-electric current will depend upon the applied voltage, provided that the applied voltage is in the region of cut-off for spontaneous acousto-electric oscillations.

3,660,757

FLASH TUBE POTENTIAL INDICATOR

Willis M. Winslow, Wheatridge, Colo., assignor to Wefco, Inc., Wheatridge, Colo.

Filed Feb. 2, 1970, Ser. No. 7,605
Int. Cl. G01r *13/36, 19/16*
U.S. Cl. 324—122 **10 Claims**

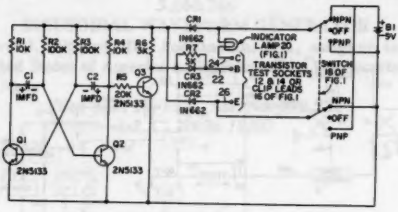


This disclosure describes a flash tube potential indicator that indicates whether or not a high voltage line is energized. Rectifiers convert a.c. microamps to direct current to charge capacitors. When the capacitors reach a predetermined voltage level, they are discharged through a photoflash tube. The resultant flash indicates the existence of a high voltage on the high voltage line. The various electric circuit components are mounted in a tubular structure which may or may not be directly attached via a suitable clamp to a high voltage line. In addition, to increase the safety of the invention, barium titanate rods capacitively couple the rectifiers to the high voltage line.

3,660,758
DEVICE FOR TESTING SEMICONDUCTORS

James A. Means, 2090 Suner Circle, Camarillo, Calif.

Filed July 23, 1970, Ser. No. 57,599
Int. Cl. G01r 31/22
U.S. Cl. 324—158 T 6 Claims

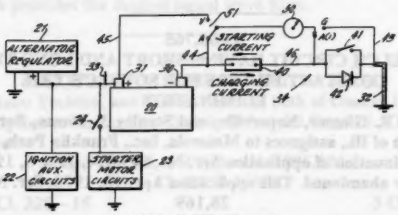


A small, compact device for quickly and easily testing semiconductors to ascertain whether they are usable or whether they are faulty because of a short or open circuit. Each condition is represented by the status of an indicator lamp, when testing bipolar transistors - (1) a flashing light indicates a good component, (2) a steady on light a shorted transistor ro excessive leakage current, and (3) a steady off light, an open component or unusually low current gain.

3,660,759
METER CONNECTION ADAPTER FOR AUTOMOBILE ELECTRICAL SYSTEM TESTER INCLUDING DIODE AND SHORTING SWITCH THEREFOR

Lee Parmater, Plainwell, Mich., assignor to Kal-Equip Company, Otsego, Mich.

Filed Mar. 19, 1970, Ser. No. 20,925
Int. Cl. G01n 27/46
U.S. Cl. 324—29.5 9 Claims



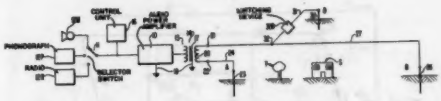
A length of flexible conductive wire acts as a shunt for a voltage-current meter for an automotive test device. One end of the wire is connected to a connector adapted to be connected to an automotive battery terminal and its other end is connected to a conductive body housing having a stud which can receive the automotive battery terminal. The body housing contains a diode and a shorting switch for the diode where the forward resistance of the diode can be connected in series with the shunt during voltage regulator tests and is short-circuited by the switch during motor starting.

3,660,760
INDUCTIVE COMMUNICATION SYSTEM

Howard A. Schaad, Abingdon, Ill., and Richard L. Randolph, San Rafael, Calif., assignors to William J. Foley, Galesburg, Ill., a part interest

Filed July 23, 1969, Ser. No. 844,047
Int. Cl. H04b 13/02
U.S. Cl. 325—28 22 Claims

There is disclosed a communication system in which a pair of spaced conductor rods or elements, embedded or placed in the earth, and energized by a signal voltage to induce a dynamic magnetic signaling field above the earth surface between the conductor element and having a specific and relatively large controlled area of high signal resolution. A match of the earth's impedance to the signal source is achieved by adding additional conductors at the remote conductor point. In locations where it may not be practical to embed the elements in a vertical position, horizontally buried elements may be used and the conductor nearest the signal

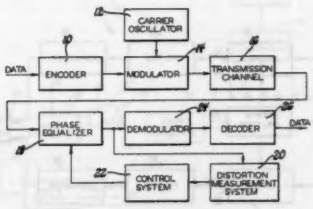


voltage source may be constituted by an earth-embedded utility pipe. Switching devices controlled by coded signals may be used to connect or disconnect such conductors to thereby vary the system impedance or control the strength of the magnetic induction signaling field, as well as vary the area and shape of the magnetic induction signaling field. The magnetic induction signaling field may be picked up by magnetic pick-up coil or other devices sensitive to magnetic fields.

3,660,761
AUTOMATIC EQUALIZATION SYSTEM FOR DATA TRANSMISSION CHANNELS

Samuel T. Harmon, Jr.; Kenneth E. Monroe, and Gino Venturi, all of Ann Arbor, Mich., assignors to Datamax Corporation, Ann Arbor, Mich.

Filed Jan. 29, 1970, Ser. No. 6,738
Int. Cl. H04l 1/00; H04b 1/10
U.S. Cl. 325—42 5 Claims

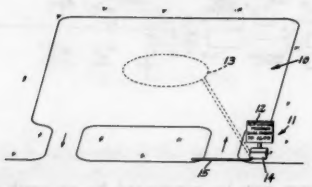


A system for equalizing the phase distortion of a data transmission channel is disclosed wherein the equalizer comprises a fixed delay network and a plurality of selectable delay networks. The fixed delay network exhibits an envelope delay similar to the difference between the characteristic envelope delay for the channel and a desired delay for the channel and the selectable delay networks may be connected therewith in any combination to produce the desired envelope delay. Control means are provided for successively connecting the selectable delay networks to form a successive plurality of test channels. The phase distortion produced by each channel is measured and compared with that produced by each other test channel. The control means includes means for reconnecting the combination of selectable delay networks which produce the smallest value of phase distortion to provide equalization of the channel for data transmission.

3,660,762
APPARATUS AND METHOD FOR TRANSMITTING MESSAGES TO VEHICLES IN PRESELECTED OFF THE HIGHWAY AREAS

Darrell S. Smith, 402 4th Street, S.E., Cut Bank, Mont.

Filed Aug. 6, 1969, Ser. No. 847,853
Int. Cl. H04h 1/00
U.S. Cl. 325—51 5 Claims

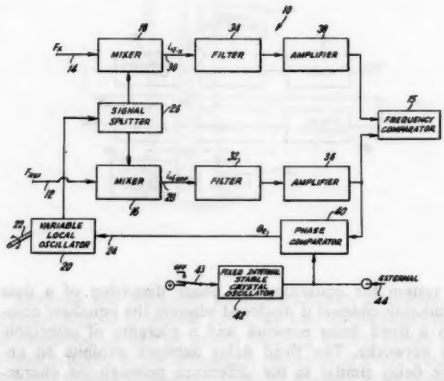


A transmitter operatively mounted for transmitting prerecorded messages to mobile radio receivers within a predetermined area, sign adjacent the area to indicate the frequency of the transmitter and condition responsive means, such as a pressure-sensitive switch, for causing the transmitter to transmit at least one complete message upon the occurrence of the condition, such as an automobile passing over the pressure-sensitive switch.

3,660,763
WIDE BAND FREQUENCY EXTENDER FOR A FREQUENCY COMPARATOR

Benjamin Parzen, 303 East 57th Street, New York, N.Y.

Filed Jan. 8, 1970, Ser. No. 1,472
Int. Cl. H04b 1/00
U.S. Cl. 325—363 5 Claims

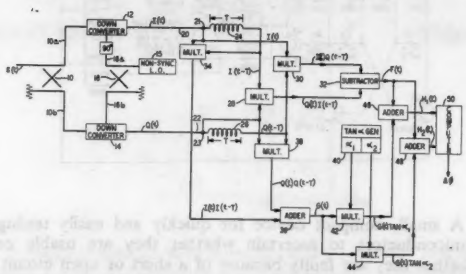


An apparatus for effectively extending the operating range of a frequency comparator is described. Input signals of close frequency are heterodyned by a common variable local oscillator to produce intermediate frequency (i.f.) signals at the output of mixers. A stable reference crystal oscillator signal source having a frequency coincident with the input frequency of a frequency comparator is compared with one of the i.f. signals. An error signal representative of the comparison is applied to the variable local oscillator to alter the frequency thereof in a direction to phase lock the one i.f. signal to the reference signal source. Frequency comparisons of signals over a large frequency band is provided.

3,660,764
NON-COHERENT DIFFERENTIAL PHASE DETECTION

James E. Goell, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 26, 1969, Ser. No. 879,994
Int. Cl. H04b 1/16; H04l 27/22
U.S. Cl. 325—320 17 Claims

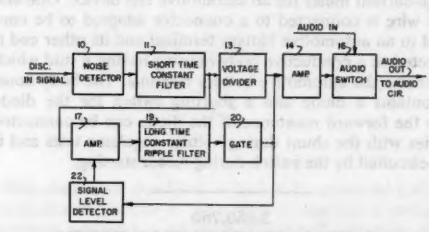


A differentially phase modulated (DPM) information signal, such as a binary differentially coherent phase shift-keyed signal, is detected without the need for a synchronous local oscillator by decomposing the carrier information signal into its baseband conjugate in-phase and out-of-phase components, $I(t)$ and $Q(t)$, respectively, generating from the components the functions $F(t) = Q(t)I(t-T)-I(t)Q(t-T)$ and $G(t) = I(t)I(t-T)+Q(t)Q(t-T)$ and subsequently forming $H_1(t) = F(t)+G(t) \tan \alpha_1$, and $H_2(t) = F(t)+G(t) \tan \alpha_2$, where T is the bit interval and α_1 and α_2 are arbitrary but generally unequal. In the binary case, however, $\alpha_1=\alpha_2=0$ and $F(t)$ is the differentially phase detected signal. In higher order DPM systems the equations for $H_1(t)$ and $H_2(t)$ are simultaneously solved to recover the differential phase information.

3,660,765
SQUELCH CIRCUIT HAVING SHORT AND LONG TIME CONSTANT FILTERS FOR SQUELCH TAIL ELIMINATION

James R. Glasser, Naperville, and Stanley J. Tomsa, Berwyn, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Continuation of application Ser. No. 643,874, June 6, 1967, now abandoned. This application Apr. 13, 1970, Ser. No. 28,169
Int. Cl. H04b 1/10
U.S. Cl. 325—478 12 Claims



A squelch filter circuit is provided having a short time constant ripple filter and a long time constant ripple filter. The long time constant ripple filter is responsive to signals just above squelch threshold in order to provide maximum sensitivity and smooth operation. At strong signal levels, where the long time constant ripple filter is not necessary, the circuit switches to a short time constant filter. The circuit reverts to the long time constant filter if the signal drops to low signal levels relatively slowly, to keep the squelch open

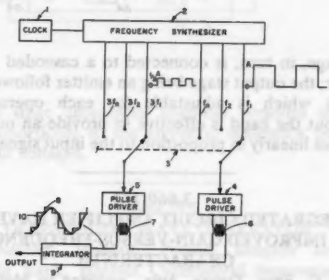
during fade and flutter. If the signal drops very rapidly, as, for example, where the transmitter ceases transmission, only the short time constant filter is operative and the turn off of the squelch circuit is very rapid, thus eliminating the noise burst or "squelch tail."

3,660,766

SINUSOIDAL WAVEFORM GENERATOR

Edward J. Hilliard, Jr., Portsmouth, R.I., assignor to The United States of America as represented by the Secretary of the Navy

Filed Apr. 28, 1971, Ser. No. 138,226
Int. Cl. H03b *19/00*
U.S. Cl. 328—14 2 Claims



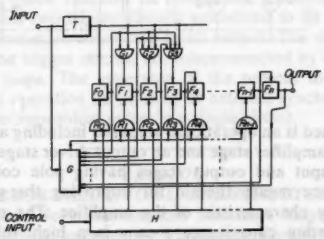
There is disclosed an arrangement for generating sinusoidal waves of low harmonic content and relatively high output level wherein selected square waves of related amplitude and frequency derived from a digital frequency synthesizer are utilized to trigger conventional driving circuits. The outputs of these driving circuits are combined and the complex signal obtained therefrom fed to an integrator which provides the desired signal wave form.

3,660,767

FREQUENCY DIVIDER CIRCUIT SYSTEM

Hirokazu Yoshino, and Tomio Yoshida, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 18, 1969, Ser. No. 886,131
Int. Cl. H03b *19/00*
U.S. Cl. 328—15 3 Claims



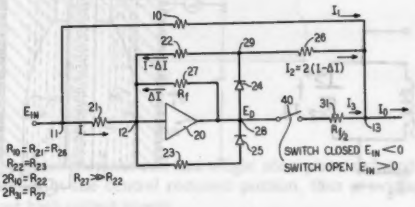
A frequency divider wherein the pulse input having been delayed by a predetermined time interval is impressed upon a plurality of cascade connected flip-flops, and the output from each of the flip-flops is fed to an AND gate to which is also fed the input which has not passed through the delay circuit to produce a resultant AND output to be fed back to each of the required flip-flops, thereby increasing the upper limit of the frequency to be divided and practically eliminating the danger of a malfunction in the system.

3,660,768

PRECISION RECTIFIER WITH IMPROVED TRANSIENT RESPONSE

Carl Leslie Dammann, Holmdel, and Frederick Alan Saal, Colts Neck, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 21, 1970, Ser. No. 100,175
Int. Cl. G06g *7/14*
U.S. Cl. 328—26 7 Claims



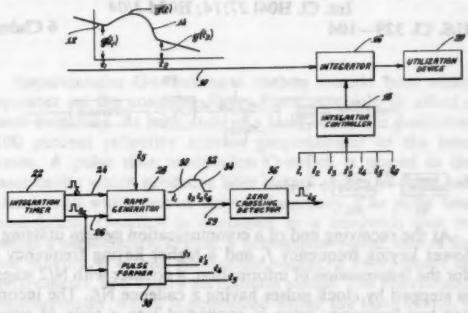
A precision rectifier circuit rectifies voltage signals near zero without a loss in transient response. This is accomplished by reducing the gain of the amplifier with an additional feedback resistor. The error in the output current caused by this resistor is canceled by supplying additional current from the amplifier to the rectifier output through a second rectifier and a resistor.

3,660,769

MEANS FOR INTEGRATING A TIME LIMITED SIGNAL HAVING BASE LINE DRAFT

William E. Jordan, Foxboro, and William E. Earle, North Easton, both of Mass., assignors to The Foxboro Company, Foxboro, Mass.

Filed June 2, 1969, Ser. No. 829,681
Int. Cl. G06g *7/18*
U.S. Cl. 328—127 15 Claims



An apparatus for integrating a time limited signal is described. The signal is applied to an integrator for a predetermined time period. A measurement of the input signal base line is made before and after integration, and a voltage proportional to the difference is applied to the integrator for a second time period, proportional to the first time period.

3,660,770

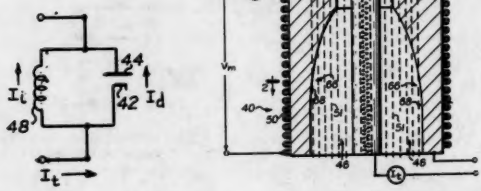
MAGNETICALLY CONTROLLED ELECTRON TUBE FUNCTION GENERATOR

William W. Snow, 3250 54th Street, Woodside, N.Y.

Filed Apr. 7, 1970, Ser. No. 26,190
Int. Cl. H01j *21/18*
U.S. Cl. 328—253 21 Claims

A function generator. An electron tube is provided having a cathode, and an anode coextensive with and spaced from

the cathode so as to form a gap therebetween. The anode is at a higher potential than the cathode so as to create an electric field between the anode and the cathode. A means for obtaining an output from the function generator as a desired function of the input to the function generator is also provided. This means includes a means for providing a magnetic field in the gap which is normal to the electric field and further includes means for varying the direction of the magnetic field. The variation in the electric field is obtained by varying the width of the gap in the direction of the longitudinal axis of the tube. The variation in the magnetic field is obtained by varying the intensity of the magnetic field in the direction of the longitudinal axis of the tube. By use of additional magnetic fields or by separating the cathode and anode into distinct portions, or a combination thereof multiple functions may be provided.

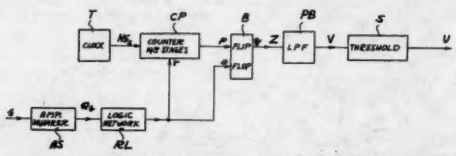


3,660,771

DEMODULATOR FOR TWO-FREQUENCY COMMUNICATION SYSTEM

Fabio Balugani, and Paolo Fornasiero, both of Milan, Italy, assignors to Societa' Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Nov. 30, 1970, Ser. No. 93,537
Claims priority, application Italy, Dec. 3, 1969, 25269 A/69
Int. Cl. H04l 27/14; H03d 3/04
U.S. Cl. 329—104 **6 Claims**



At the receiving end of a communication system utilizing a lower keying frequency f_1 and a higher keying frequency f_2 for the transmission of information, a counter with N/2 stages is stepped by clock pulses having a cadence Nf_2. The incoming two-frequency wave is converted into a train of signal pulses occurring at the end of each half-cycle, these signal pulses being used to reset the counter which therefore does not generate an output if the signal pulses follow one another at a rate equal to or faster than $\frac{1}{2}f_2$. With lower incoming frequencies, the counter sets a flip-flop which is then reset by the next signal pulse and which thereby generates a stepped wave to yield, on integration, a definite DC voltage.

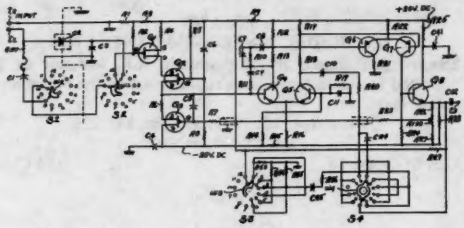
3,660,772

WIDE-BAND DIRECT CURRENT COUPLED AMPLIFIER FOR ALTERNATING CURRENT UTILITY

Frederick Rodney Holt, Manhattan, N.Y., assignor to The Hickok Electrical Instrument Company, Cleveland, Ohio

Filed May 13, 1970, Ser. No. 36,977
Int. Cl. H03f 3/42
U.S. Cl. 330—18 **4 Claims**

A wide-band direct-current-coupled amplifier for alternating current use having substantially flat operating characteristics and a high signal-to-noise ratio between input and output signal levels; the amplifier consisting of a high impedance input stage formed of a capacitive divider coupled to three FETs connected into a triple cascode circuit, which



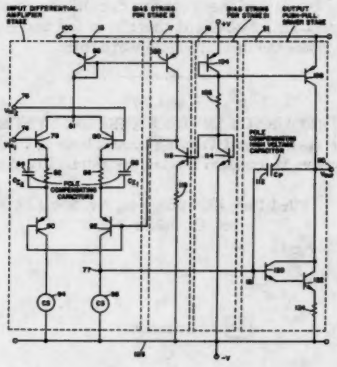
input stage, in turn, is connected to a cascoded differential amplifier; the output stage being an emitter follower. Suitable feedback which is adjustable for each operating range throughout the band is effective to provide an output signal that varies linearly in proportion to the input signal.

3,660,773

INTEGRATED CIRCUIT AMPLIFIER HAVING AN IMPROVED GAIN-VERSUS-FREQUENCY CHARACTERISTIC

Maurice G. Free, Tempe, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Feb. 5, 1970, Ser. No. 8,835
Int. Cl. H03f
U.S. Cl. 330—30 D **17 Claims**



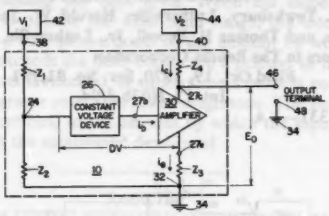
Disclosed is an operational amplifier including an input differential amplifier stage and an output driver stage, with each of the input and output stages having pole compensating capacitance means therein for improving the gain-versus-frequency characteristic of the amplifier. The output pole compensating capacitance means is a high voltage MOS capacitor which splits two of the poles of the amplifier's transfer function, broadbanding one of the poles and narrowbanding the other of the poles to improve the gain-versus-frequency characteristic of the amplifier. The input pole compensating capacitance means is a low voltage PN junction capacitor which relocates one of the poles of the amplifier's transfer function to thereby further improve the gain-versus-frequency characteristic of the amplifier while at the same time minimizing the total monolithic integrated circuit die area required for the fabrication of the input and output pole compensating capacitance means.

3,660,774

SINGLE STAGE DIFFERENTIAL AMPLIFIER

Joseph J. Eachus, Cambridge, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 16, 1969, Ser. No. 885,597
Int. Cl. H03f 3/68
U.S. Cl. 330—30 D 17 Claims



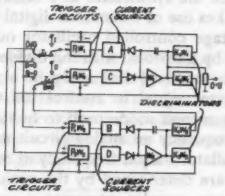
A single stage differential amplifier provides an output voltage proportional to the algebraic difference between a pair of input voltages.

3,660,775

TRAPEZOIDAL WAVE GENERATOR

Andrzej Nechay, Warsaw, Poland, assignor to Polska Akademia Nauk, Instytut Cybernetyki Stosowanej, Warszawa, Poland

Filed May 6, 1970, Ser. No. 34,991
Claims priority, application Poland, May 8, 1969, P 133421
Int. Cl. H03k 4/00
U.S. Cl. 331—57 6 Claims



Disclosed is a wave generator capable of generating trapezoidal wave shapes. The generator comprises two operational amplifiers which function as integrators. Each operational amplifier has two trigger circuits connected to its input and two discriminators connected to its output. The discriminators and the trigger circuits are interconnected by a series of feedback loops. The generator of the present invention is capable of operation on internal or external synchronization to generate trapezoidal pulses in a single circuit.

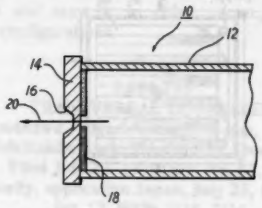
3,660,776

MIRROR MEANS FOR LASER STRUCTURES

Eiso Yamaka; Norio Karube, and Masakazu Akiyama, all of Osaka, Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed June 22, 1970, Ser. No. 48,206
Claims priority, application Japan, June 27, 1969, 44/51987
Int. Cl. H01s 3/04
U.S. Cl. 331—94.5 4 Claims

A mirror means used in a gas laser structure for permitting an infra-red laser beam to pass therethrough comprising a substrate plate made of an infra-red transparent material and secured air-tightly to the one end of the laser tube, the central portion of the substrate plate being made thinner than the remaining portion and sized substantially larger than the sectional area of the output laser beam, and a reflective metal film coated on the inner surface of the remaining portion. The mirror means is free from being destroyed by a high temperature increase and has a light absorption reduced to a minimum at the central recessed portion, thus providing an utmost high output power.

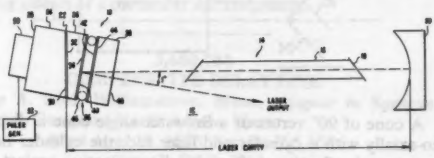


3,660,777

LASER PULSE TIME MODULATION Q-SWITCH

Allen M. Erickson, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Apr. 16, 1971, Ser. No. 134,790
Int. Cl. H01s 3/11
U.S. Cl. 331—94.5 12 Claims



Apparatus for Q-switching a carbon dioxide laser which operates on the scanning Fabry-Perot principle to affect a laser switching. At both ends of a laser cavity are positioned 100 percent reflective mirrors perpendicular to the laser beam. A pulse time modulation Q-switch is placed in the laser cavity which produces laser output pulses of fixed amplitude and width, but of varying frequency. The pulse time modulation, Q-switch is contained in a sandwich that includes a piezoelectric crystal, a germanium wedge, one of the end mirrors, a second germanium wedge, a Fabry-Perot interferometer, and a third germanium wedge. The Fabry-Perot interferometer, which is positioned within the laser cavity, is at a slight angle to the laser beam, while the 100 percent reflective mirror is perpendicular to the laser beam. Voltage pulses applied to the piezoelectric crystal cause the Fabry-Perot interferometer to change from a highly reflective state to a highly transmissive state, whereupon lasing occurs. When the Fabry-Perot interferometer changes back to its highly reflective state, a laser pulse is fed out of the laser cavity.

3,660,778

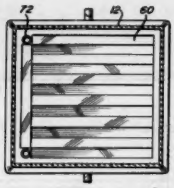
LASER BEAM FOLDING DEVICE

Leo J. Le Blanc, Sr., 1116 Cypress Lake Drive, Fort Myers, Fla.

Filed June 16, 1970, Ser. No. 46,755
Int. Cl. H01s 3/08
U.S. Cl. 331—94.5 12 Claims

The resonant cavity of anionized gas laser device is elongated by conducting a laser beam between internal reflectors along a plurality of parallel plasma tubes located between

beam folding reflectors in a gas discharge region. The plasma tubes are cooled by a circulating coolant and the length of



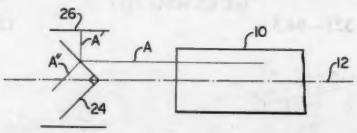
the resonant cavity is adjustable adjacent to the internal reflectors.

3,660,779

ATHERMALIZATION OF LASER RODS

David W. Cuff, Chepachet, R.I., and Paul G. De Baryshe, Lincoln, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Jan. 2, 1970, Ser. No. 236
Int. Cl. H01s 3/00
U.S. Cl. 331—94.5 **8 Claims**



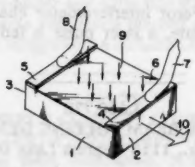
A cone of 90° vertex or a Brewster angle cone is disposed co-axially with a cylinder and laser rod, the cylinder having an internal reflective surface, for discriminating against radially polarized components of the laser light. An alternative embodiment discriminates against tangentially polarized light by disposing a Brewster angle cone co-axially with the rod and uses another cone as the retroreflective element for the laser system. In any of the embodiments, a 90° Faraday rotator may be used to change the polarization of the mode conserved.

3,660,780

SEMICONDUCTOR LASERS

Seishi Iida, Fujisawa, and Yoichi Unno, Kamakura, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed May 26, 1970, Ser. No. 40,608
Claims priority, application Japan, May 28, 1969, 44/40905; Mar. 7, 1970, 45/19051
U.S. Cl. 331—94.5 **10 Claims**



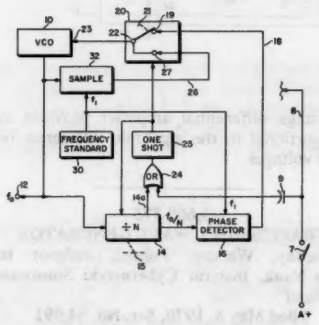
In a semiconductor laser comprising a body of semiconductor laser material which is caused to radiate coherent light by a pumping input, at least two electrodes are provided adjacent the reflective end surfaces or longitudinal edges and a control voltage is impressed across the electrodes to reduce multifrequency modes to a single central frequency mode or to a central frequency mode with a minority of side band modes.

3,660,781

LOW POWER FREQUENCY SYNTHESIZER WITH TWO PHASE LOCKING LOOPS

John M. Tewksbury, Lutherville; Harold W. Jackson, Baltimore, and Thomas H. Powell, Jr., Lutherville, all of Md., assignors to The Bendix Corporation

Filed Oct. 19, 1970, Ser. No. 81,991
Int. Cl. H03b 3/04
U.S. Cl. 331—1 A **17 Claims**



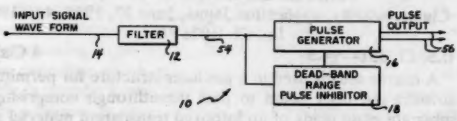
A stabilized, low power frequency synthesizer operates in two time determined modes. In a temporary first mode used to initially place the synthesizer at a selected frequency, the synthesizer makes use of a standard digital phase locked loop wherein a voltage controlled oscillator output frequency is counted down by a divider, with the divided frequency being compared to a standard frequency in a phase detector to generate an error signal to control the voltage controlled oscillator. In a second mode used to hold the synthesizer at the selected frequency an analog circuit samples the voltage controlled oscillator output frequency at regular sampling intervals which are determined by the period of the standard frequency. These samples comprise a second error signal. The circuit characteristics of the various error signal generating circuits permit the second error signal to be permanently connected to the voltage controlled oscillator while a switching circuit permits connection of the first error signal to the voltage controlled oscillator in accordance with a predetermined timed program when the selected frequency is changed or during initial start up.

3,660,782

SIGNAL LEVEL-TO-PULSE RATE CONVERTER

David Friedman, and Kenneth Levy, both of Framingham, Mass., assignors to Computervision Corporation, Burlington, Mass.

Filed Aug. 24, 1970, Ser. No. 66,344
Int. Cl. H03k 7/10
U.S. Cl. 332—1 **14 Claims**



An electronic circuit for generating pulses at a rate and of a nature representative of an input signal level. In order to

limit the rate of change in the pulse rate to a rate of change at which an element driven by the pulses can respond, a filter is provided which establishes a maximum positive and negative slope for the signal waveform. The same slope is achieved for any abrupt step in the input signal level regardless of the magnitude of the step change. The slope-limited signal is then fed to a symmetrical zero-to-plus or minus infinite rate integrator which establishes a dead-band range surrounding the zero level. When the slope-limited signal level is outside the dead-band range, the integration proceeds at a rate proportional to the amount by which the signal level exceeds the dead-band until a positive or negative threshold level is reached, at which time a pulse is generated and the integrator reset to a lower magnitude. The pulse rate is thus proportional to the amount by which the input signal level exceeds the established dead-band.

3,660,783

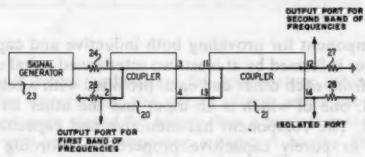
SIGNAL SPLITTING NETWORK WHEREIN AN OUTPUT FROM SECOND COUPLER IS FED BACK TO ISOLATED PART OF FIRST COUPLER

Joseph D. Cappucci, Wayne, N.J., assignor to Merrimac Research and Development Company, West Caldwell, N.J.

Continuation of application Ser. No. 866,632, Oct. 15, 1969, now abandoned. This application Jan. 21, 1971, Ser. No. 108,550

Int. Cl. H01p *1/20*

U.S. Cl. 333—10 **6 Claims**



A composite coupler is disclosed formed by a pair of analogous quadrature couplers. Energy passed from the first coupler to the second is fed back to the first initiating a recirculating effect which provides composite coupling characteristics described by a higher order differential equation than describes the original pair of couplers.

3,660,784

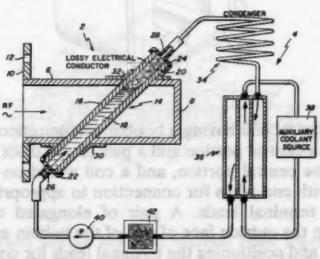
ENERGY ABSORBER AND EVAPORATIVE COOLING SYSTEM

Howard Scharfman, Lexington, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Aug. 28, 1970, Ser. No. 67,723

Int. Cl. H01p *1/22, 1/26*

U.S. Cl. 333—22 F **5 Claims**



A transmission line termination load or attenuator device is provided with energy absorbing means including a medium for absorption of thermal energy, particularly, in the electromagnetic spectrum. The device is coupled to an evaporative type cooling system to evolve a relatively low pressure, low flow rate means for handling extremely high power levels with a relatively small volume of absorbent. The device utilized in either application has substantially low reflection coefficient characteristics over relatively wide frequency bandwidths and may be in either rectangular or coaxial waveguide configurations.

3,660,785

TRANSVERSAL EQUALIZER

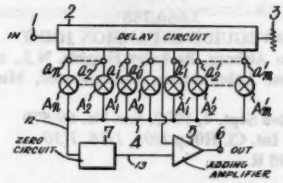
Jun-Ichi Hosokawa, Higashikatsushika-gun, Japan, assignor to Kabushikikaisha Asahi Shimbunsha, Osaka-fu, Japan

Filed July 22, 1970, Ser. No. 57,164

Claims priority, application Japan, July 25, 1969, 44/58842

Int. Cl. H03h *7/28, 7/14*

U.S. Cl. 333—28 **5 Claims**



A transversal equalizer for equalizing a transmitted waveform with the use of an echo waveform for correction which is formed through a zero circuit or an energy suppressing circuit of a particular AC frequency.

3,660,786

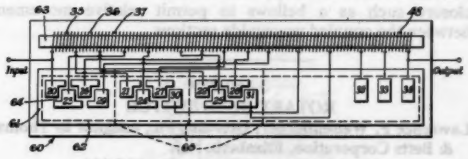
COMPENSATED DELAY LINE

George A. Senf, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Aug. 20, 1970, Ser. No. 65,458

Int. Cl. H03h *7/32*

U.S. Cl. 333—29 **5 Claims**



A delay line having additional compensation for output phase distortion and output pulse top ringing which includes a first feedback capacitor connected to the input lead and bridging the first three inductive coil sections of the delay line, with a series of successive feedback capacitors connecting each consecutive coil interconnection point and bridging the three inductive coil sections immediately following the coil interconnection point.

3,660,787

LOW FREQUENCY PAPER TRANSIENT FILTERS

Aly A. Mahmoud, Oxnard, Calif., and The United States of America as represented by the Secretary of the Navy

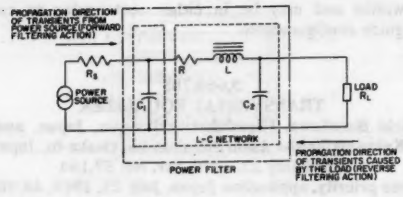
Filed Aug. 19, 1970, Ser. No. 64,955

Int. Cl. H03h *7/04;* **H04b** *15/00*

U.S. Cl. 333—76 **5 Claims**

Transients in electrical power systems are capable of causing operational malfunctions in, and possible damage to, delicate equipment such as computers and data processing

apparatus. The present disclosure is directed to the design of an inductance-capacitance filter which effectively suppresses



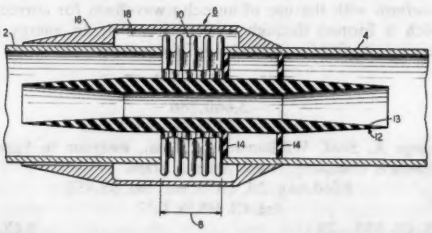
externally-produced transients as well as those generated within the load itself.

3,660,788

WAVEGUIDE EXPANSION JOINT

Dietrich Anselm Alsberg, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 4, 1970, Ser. No. 69,579
Int. Cl. H01p *1/06, 1/16, 1/30*
U.S. Cl. 333—98 R **6 Claims**



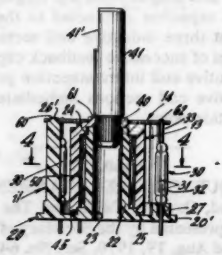
An expansion joint for a waveguide transmission system utilizes a dielectric member to transfer the signal across the joint in the form of a trapped mode and a flexible mechanical closure such as a bellows to permit relative movement between the coupled waveguide sections.

3,660,789

ROTARY REED SWITCH

Lawrence P. Weisenburger, Ottsville, Pa., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Apr. 19, 1971, Ser. No. 135,281
Int. Cl. H01h *19/04, 51/28*
U.S. Cl. 335—206 **11 Claims**



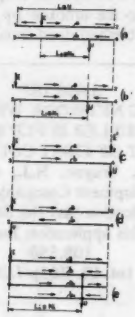
A rotary reed switch includes an integral support structure having a central elongated rotor support about which is arranged an array of reed switches, with a rotor being mounted on the rotor and is operative to selectively actuate the individual reed switches as the rotor is rotated on the central rotor support.

3,660,790

ELECTRICAL INDUCTIVE/CAPACITIVE COMPONENT

Mario Palazzetti, Turin, Italy, assignor to Fiat Societa per Azioni, Turin, Italy

Filed July 15, 1970, Ser. No. 55,185
Claims priority, application Italy, July 16, 1969, 52670 A/69
Int. Cl. H01f *15/14*
U.S. Cl. 336—69 **3 Claims**



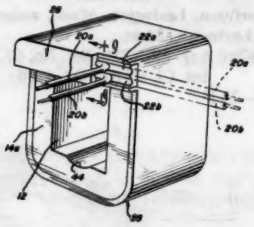
A component for providing both inductive and capacitive properties is formed by at least two interleaved spiral coils insulated from each other and each provided with a respective terminal, one of which is an input and the other an output terminal. The component has inductive and capacitive properties, or purely capacitive properties, according to the spacing between the terminals, if any, measured along the spirals.

3,660,791

ELECTRICAL COIL

Dhu Aine J. Davis, Wheaton, Ill., assignor to Hermetic Coil Co., Inc.

Filed Sept. 10, 1970, Ser. No. 71,096
Int. Cl. H01f *15/10*
U.S. Cl. 336—192 **5 Claims**



An electrical coil having a bobbin configuration with a coil receiving a central portion and a pair of end discs at opposite ends of the central portion, and a coil would on the central portion with end wires for connection to appropriate flexible wire-like terminal leads. A pair of elongated troughs are formed on the outside face of one of the bobbin end discs for receiving and positioning the terminal leads for connection to the winding end wires. Apertures are formed through the one end disc at the ends of the troughs so that the winding end wires may be inserted therethrough for connection to the terminal leads. An encapsulating casing for the coil covers a portion of the flexible terminals leads and, after encapsula-

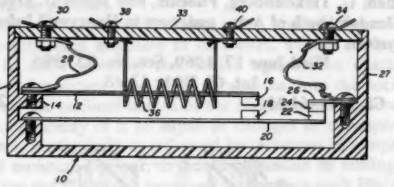
tion, the leads are bent outwardly from the one end disc generally perpendicular thereto for connection in an appropriate circuit. A heat flangible fuse is joined in one of the innermost turns of the coil and is positioned on and spans a pair of spaced raised ribs formed on the bobbin central portion so that the space between the ribs forms a recess to receive the fuse in a molten state to insure a positive fuse break. At least one elongated raised rib is formed on the central portion and extends between the end discs to provide insulating air spaces on opposite sides of the rib, between the wound coil and the bobbin central portion.

3,660,792

TIME DELAY SWITCH

Edwin H. Strain, Allentown, and Nalini R. Das, Bethlehem, both of Pa., assignors to Caloric Corporation, Topton, Pa.

Filed Dec. 16, 1970, Ser. No. 98,496
Int. Cl. H01h *37/52, 37/62, 61/01*
U.S. Cl. 337—102 **4 Claims**



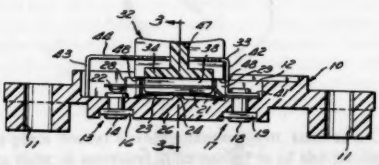
A switch which embodies a fail safe feature achieved by means for interrupting the switch circuit when the switch contacts remain closed for longer than a predetermined time period, said switch comprising a support having first and second terminals to one of which a bimetallic element is conductively connected, and third and fourth terminals to which respective ends of a heater element are connected, a conductive strip disposed in normally nonconductive relation to any of the terminals, and a contact member attached to the second terminal, with the bimetallic element and conductive strip being normally spaced out of electrical contact with one another, and with the conductive strip and contact member being normally in electrical contact with one another.

3,660,793

THERMOSTAT WITH MANUAL RESET

Edward G. Them, and Walter C. Kowalski, both of Mansfield, Ohio, assignors to Therm-O-Disc, Incorporated, Mansfield, Ohio

Filed Apr. 1, 1970, Ser. No. 24,605
Int. Cl. H01j *37/54;* **H01h** *37/70, 37/74*
U.S. Cl. 337—348 **4 Claims**



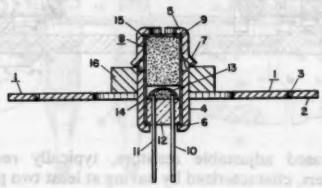
A structurally simple low cost manual reset thermostat is disclosed. The thermostat includes a one piece body and two terminal assemblies. The rivet of one terminal assembly connects the switch arm and a reset retainer. The switch arm retains a snap disc in its assembled position. Four guide projections with two on each side of the spring arm laterally locate the snap disc. A reset member is positioned by the guide projections and is arranged to engage the snap disc on opposite sides of the spring arm. Stops are provided to prevent overstressing of the disc by the reset member.

3,660,794

ELECTROPYROTECHNIC LINK

Henry M. Brizzolara, Allentown, Pa., assignor to Atlas Chemical Industries, Inc., Wilmington, Del.

Filed May 7, 1970, Ser. No. 35,493
Int. Cl. H01h *37/76*
U.S. Cl. 337—401 **5 Claims**



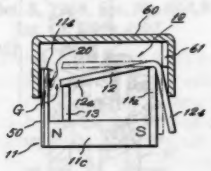
An electropyrotechnic link having two connectors held together by a ring of fusible material. When the ring is melted by heat, the two connectors separate. The heat may come from an external source such as a fire or from an electrically activated burner positioned so as to melt the ring if activated.

3,660,795

CONTACTLESS SWITCHING APPARATUS

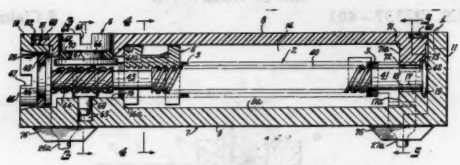
Tunekazu Kobayashi, Kawaski, Japan, assignor to Denki Onkyo Co., Ltd., Tokyo, Japan

Filed Sept. 8, 1970, Ser. No. 70,361
Claims priority, application Japan, Sept. 8, 1969, 44/85132; Sept. 9, 1969, 44/85721
Int. Cl. H01c *7/16*
U.S. Cl. 338—32 **7 Claims**



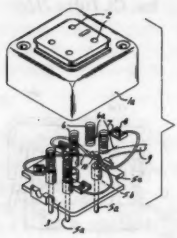
This contactless switching apparatus is comprised of a magnetic path having a U-shaped base of magnetic material, both ends whereof are made free, and a movable yoke which is put on one free end of the said base so that the inner end of the movable yoke can move inside both ends of the base, the said movable yoke being arranged so that the moving inner end of the said movable yoke may be opposite to the other free end of the said base to form a gap, either or both the movable yoke and one magnetic yoke of the base forming the said gap which are opposite to each other being made a bimetal yoke or bimetal yokes so that they bend in such a direction that the said gap may be narrowed when the base rises in temperature, a magneto-electric converting device being inserted in the said magnetic path so as to be actuated by the magnetic flux flowing in the magnetic path, and the converting device being connected to an external input power source and an external load.

3,660,796
RESISTOR WITH AT LEAST TWO POINTS OF MANIPULATION FOR ADJUSTMENT
Geoffrey Southwell, Waverly, Pa., assignor to Weston Instruments, Inc., Newark, N.J.
Filed Jan. 21, 1971, Ser. No. 108,354
Int. Cl. H01c *9/02*
U.S. Cl. 338—180 7 Claims



Fully encased adjustable resistors, typically rectilinear potentiometers, characterized by having at least two points of manipulation for adjustment. In a typical embodiment, a lead screw-operated rectilinear potentiometer has the head of the lead screw exposed at one end of the housing and is provided with an additional adjusting member the head of which is exposed through the top of the housing, the lead screw being provided with a helical gear portion and the additional adjusting member having a helical gear portion meshed therewith.

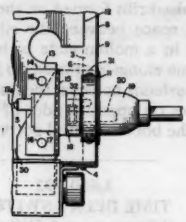
3,660,797
TELEPHONE CONNECTOR
Jerome Firestone, Mt. Vernon, N.Y., assignor to Saxton Products, Inc., Congers, N.Y.
Filed Nov. 9, 1970, Ser. No. 88,013
Int. Cl. H01r *13/12*
U.S. Cl. 339—29 R 8 Claims



A cupped housing has an open side releasably closed by a cover. Male contacts project from the exterior of the cover and each have a portion projecting beyond the interior of the cover into the open side of the cupped housing. Helical springs are pushed onto the interiorly projecting portions of the contacts and each have an open face end registering with apertures provided for this purpose in the cupped housing portion opposite the cover.

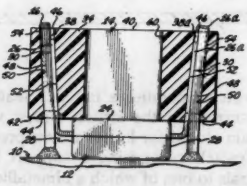
3,660,798
INTERLOCK DEVICES
Casimir C. Marzec, Chicago, Ill., assignor to Speed-O-Print Business Machines Corporation, Chicago, Ill.
Filed Dec. 11, 1970, Ser. No. 97,083
Int. Cl. H01r *13/44*
U.S. Cl. 339—36 10 Claims

A mechanical interlock device having a member movable between one position effective to prevent the insertion of an electric plug into a socket and another position wherein it is ineffective to prevent such insertion, and wherein the



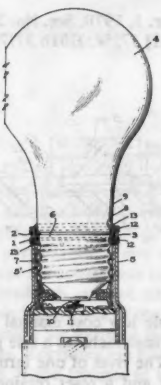
member affords a door latch when it is disposed in the aforementioned other position.

3,660,799
CONNECTOR DEVICE
William G. Tinkelenberg, Phoenix, and James D. Fredenberg, Glendale, both of Ariz., assignors to Honeywell Information Systems Inc.
Filed June 17, 1969, Ser. No. 833,986
Int. Cl. H01r *13/48*
U.S. Cl. 339—61 M 2 Claims



A demountable connector for electrically and mechanically attaching a multi-lead electronic element to a wiring panel.

3,660,800
LAMP SEAL MEANS
Lewis Detch, 2133 Chalfant Street, Pittsburgh, Pa.
Filed Apr. 17, 1970, Ser. No. 29,466
Int. Cl. H01r *13/52*
U.S. Cl. 339—94 L 10 Claims



A sealing means primarily for incandescent electric lamps which serves to prevent, primarily, entrance of moisture, and

also of other substances, into the lamp socket, and to insure against loosening of the lamp in, and its possible escape from, such socket while in use. The sealing means include, primarily, a resilient, and preferably compressible, sealing ring or collar, which may be molded from natural or synthetic rubber, and is adapted to seat between the outer end of the lamp socket and the glass envelope of the lamp bulb at the slight bulge just above the metal lamp base, and, if desired, the sealing function of the ring may be augmented by, and/or the ring secured to the envelope of the lamp bulb by a normally compressible, yieldable plastic substance, or composition, such, preferably, as a silicone adhesive which is commercially known as "RTV."

The sealing ring may be provided in one, or both, of its axial faces with a circumferential recess to receive, locate and partially confine the yieldable plastic substance, and it may also be provided with a circumferential, radially inwardly extending, groove in which may be confined a spring ring having the form either of a resilient wire ring or a coiled spring ring which serves to fill the groove and functions to maintain the desired circular form of the ring and its desired axial resiliency. If desired, the groove may be filled with a compressible plastic.

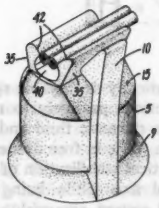
Thus, by these means, the lamp, when screwed home into circuit-establishing assembly in its socket, will be resiliently locked in such assembly and sealed against the entrance primarily of moisture, and other substances, into the socket. Moreover, the resilient nature of the sealing means assures a continuable ability of it to adjust to changes in atmospheric conditions, particularly as reflected in variations of temperature and moisture content, to thereby maintain its sealing effect during the life of the lamp and to enhance such life, and the life of the socket.

3,660,801

ONE-PIECE SOCKET FOR DECORATIVE LIGHT

Bernard Paulfus, Palos Hills, Ill., assignor to Noma-World Wide Inc., Chicago, Ill.

Filed Jan. 11, 1971, Ser. No. 105,399
Int. Cl. H01r *11/20*
U.S. Cl. 339—97 L **10 Claims**



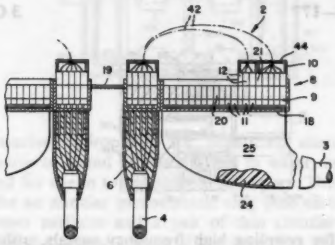
A one-piece socket for a decorative light, such as a Christmas tree light, is provided. The socket is of the pin-tap terminal type and employs a pair of resilient gripper arms at the base of the socket which are adapted to flex apart to accommodate an electrical wire and to retain the wire in firm connection with the pin-tap terminals when the wire is positioned in a wire receiving channel defined by the arms. The arms are formed with guide surfaces which direct the wire into the channel and which also aid in spreading the arms apart when the wire is forced thereagainst so as to facilitate the positioning of the wire in the channel.

3,660,802

CONNECTING ARRANGEMENT FOR MULTICONDUCTOR CABLES

Markus Staudt, Basel, Switzerland, assignor to Neidecker & Co., Basel, Switzerland

Filed Mar. 20, 1970, Ser. No. 21,458
Claims priority, application Switzerland, Mar. 17, 1969, 3943/69
Int. Cl. H01r *23/10, 23/52*
U.S. Cl. 339—126 RS **10 Claims**



A trunk cable has its end fitted with a multicontact plug that is held in a frame member of a connecting arrangement. A similar multicontact plug is fitted to each branch cable, and is held next to the trunk plug with all the plug contacts exposed on one face of the frame member. At least one jack body can be fitted over all the exposed contacts to couple the trunk cable conductors to those of the branch cables. A cover is hermetically attached to the frame member to cover the jack body and all of one face of this frame member. The plug casings have their edges soldered together and the wires leading away from them are potted with insulating resin in lead shells or synthetic resin shells which are sealed to the casings so that the entire coupling arrangement is fully sealed, while the connections can be easily changed by removing and replacing the upper plug bodies.

3,660,803

ELECTRICAL CONNECTORS

Frank E. Cooney, Manhattan Beach, Calif., assignor to The National Cash Register Company, Dayton, Ohio

Filed Oct. 8, 1969, Ser. No. 864,591
Int. Cl. H05k *1/07*
U.S. Cl. 339—176 MP **2 Claims**

A connector comprised of a body member formed with a longitudinal slot along the upper surface thereof for receiving a circuit card. A plurality of contact elements, arranged in sets of four, are disposed within the body member along the longitudinal slot. In each set of contact elements the upper portions of two of the elements are disposed to form a pair of adjacent coplanar contacts accessible on one side of the longitudinal slot, the upper portions of the other two of the elements are disposed to form an opposing pair of adjacent coplanar contacts accessible on the other side of the longitu-

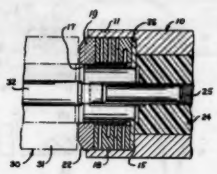
dinal slot, and the lower portions of the four elements are disposed so as to form four contacts accessible on the lower surface of the body member in openings formed therein so as to be aligned in a direction transverse to the longitudinal slot.

3,660,804

HIGH FREQUENCY COUPLING DEVICE

Charles J. Bebber, Jr., Commack, N.Y., assignor to The Narda Microwave Corporation, Plainview, N.Y.

Filed Apr. 17, 1968, Ser. No. 722,006
Int. Cl. H01r *13/24*
U.S. Cl. 339—177 **3 Claims**



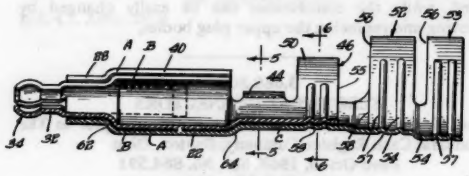
A device for coupling high frequency signals, utilizing a non-inductive spring member fabricated from solid tubular material wherein slots are made through a substantial portion of the tubular material in planes orthogonal to the axis of the tube, with successive cuts originating at different radial locations.

3,660,805

SHIELDED CABLE CONNECTOR AND METHOD OF MAKING THE SAME

Cletus G. McDonough, Elmhurst, Ill., assignor to Molex Incorporated, Downers Grove, Ill.

Filed Aug. 5, 1970, Ser. No. 61,185
Int. Cl. H01r *17/06, 17/18*
U.S. Cl. 339—183 **8 Claims**



Complementary male and female connectors are provided for shielded cables such as audio cables. Each connector comprises inner and outer sheet metal conductors with a sheet of insulation laminated to the outer conductor and located between the two conductors to insulate the two conductors. Each connector has portions for crimping respectively the center conductor and shield of a shielded cable. A method of making the connector is provided whereby a sheet of metal, a part of which has the insulating sheet laminated thereto, may be blanked and folded to bring together an outer laminated conductor part and an inner non-laminated conductor part so that the insulation is sandwiched between the two conductor parts, following which the inner and outer parts are shaped into a configuration which includes a tubular body having a longitudinal seam.

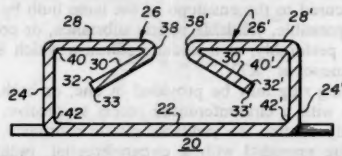
3,660,806

CONNECTOR

Joseph J. De Stephan, Edison, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Oct. 7, 1970, Ser. No. 78,684
Int. Cl. H01r *13/12*
U.S. Cl. 339—256 SP **11 Claims**

The invention is directed to an improved, integral female electrical connecting device having unique, reversibly formed resilient inturned fingers depending from associated upstanding side walls and overhanging a generally planar base portion, establishing a multiplicity of interfaces arranged to provide firm electrical and mechanical contact with a selectively dimensioned mating tab resiliently encompassed therewithin. The base, side walls, and the portions of the clasp fingers may be so proportioned relative to each other as to advantageously provide a flexing zone at each of the juncture



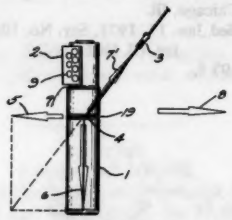
between adjacent portions. Each of the inturned free ends of the clasp fingers are provided with at least one sharp edge arranged to provide full linear contact with an associated mating tab. The basic structure may be suitably modified by the addition of side tabs and base ribs to increase the contact areas thereof. A generally centrally disposed upstruck portion of the base of the device may be arranged to cooperably detachably engage a complementary mating recessed portion in the mating tab.

3,660,807

TOWED BODY VERTICAL ATTITUDE STABILIZATION SYSTEM

Donald R. Depew; Karl L. Greenman, both of Jackson, Mich., and Daniel C. Probert, Key West, Fla., assignors to Sparton Corporation, Jackson, Mich.

Filed Mar. 14, 1968, Ser. No. 713,167
Int. Cl. B63b *21/00*
U.S. Cl. 340—3 T **12 Claims**



A stowable, automatically deployable system to stabilize a body and which functions passively to maintain a vertical body attitude within a dynamic fluid and to traverse a substantially vertical path while in free descent in the fluid, and which enables the vertical stabilization of an elongated body about its longitudinal axis while being towed through a viscous medium, said system comprising fins and a towing bridle assembly; with the shape, size and body placement of such fins in conjunction with the bridle configuration and body attachment thereof being precisely integrated to affect dihedral effect fluid stabilization.

3,660,808

ASSEMBLY FOR RECOGNIZING UNDERWATER ACOUSTIC SIGNALS

Kern M. Bowyer, Wilmington, and David L. Coursen, Newark, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 24, 1962, Ser. No. 219,342
Int. Cl. G01s *3/00*
U.S. Cl. 340—5 R **4 Claims**

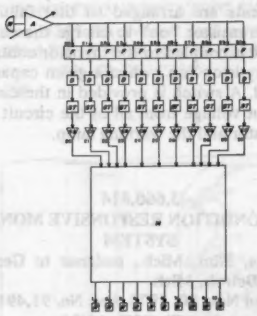
1. An assembly for determining and indicating the difference between the periods of a pair of pressure pulse

sequences received by a pressure pulse receiver situated in the ocean at a location non-normal to a longitudinal array of spaced explosive elements detonated in the ocean in a manner such as to form two parallel detonation trains travelling in opposite directions relative to each other, the period of each pressure pulse sequence received at any angle from said array varying according to said angle and being the same at a normal angle to said array, the periods of pressure pulse sequences expected to be received at different angles from said array being known, and the difference between periods of a pair of pressure pulse sequences received at any angle from said array being equal to $2(d/C)\cos\phi$ where d is the distance between explosive elements in said array, C is the speed of sound in water, and ϕ is the angle between the receiver and the longitudinal axis of said array, which assembly comprises

a. a pressure transducer;

b. an amplifier with automatic gain control coupled to said pressure transducer;

c. a frequency separator coupled to said amplifier and having n frequency-band elements each of which passes a narrow band of frequencies, said frequency-band elements collectively passing all frequencies expected



at all angles from said array and being so arranged that their center frequencies provide equal period increments Δt between successive frequency band elements, the period corresponding to the lowest center frequency being T, and the periods corresponding to the successively higher center frequencies of successive elements being $T-\Delta t, T-2\Delta t, (n-1)\Delta t$;

d. an integrating device coupled to each of said frequency-band elements;

e. a triggering device coupled to each integrating detector;

f. a sorting circuit coupled to said triggering devices, said sorting circuit having a plurality of conductors for carrying an output signal therefrom when signals are received from at least two different triggering devices, the number of said conductors being equal to the number n of said frequency-band elements in said frequency separator less one, one of said conductors carrying an output signal when the signals received are from two different frequency-band elements whose center frequencies correspond to periods which differ from each other by Δt, another by $2\Delta t$, etc. through $(n-1)\Delta t$;

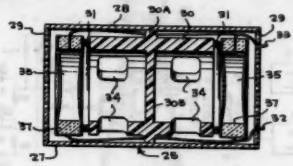
g. a multi-response circuit having $(n-1)$ response mechanisms each coupled to one output conductor from said sorting circuit, wherein n is as defined above.

3,660,809

PRESSURE SENSITIVE HYDROPHONE

Raymond H. Pearson, Richardson, Tex., assignor to Whitehall Electronics Corporation, Richardson, Tex.

Filed June 29, 1970, Ser. No. 50,707
Int. Cl. G01v *1/38*
U.S. Cl. 340—8 S **9 Claims**



A marine hydrophone for producing electrical signals responsive to sound pressure waves in water, and especially adapted for use in towed seismic streamers. The hydrophone includes an annular piezoelectric ring with electroded inner and outer surfaces and a pair of thin circular diaphragms covering the opposite ends of the ring. The diaphragm portions within the inner surface of the ring are permanently formed inwardly toward each other. An assembly of a pair of such hydrophones supported by resilient rings on opposite ends of an axially elongated support cylinder mounted within an cylindrical enclosure having perforated end caps and mounted by a resilient tube between streamer spaces is also disclosed.

3,660,810

TAPE TERMINATION ALARM DEVICE

Tetsuji Yoshii, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 9, 1970, Ser. No. 17,615
Claims priority, application Japan, Mar. 13, 1969, 44/23752; 44/23753
Int. Cl. G08b *19/00*
U.S. Cl. 340—259 **6 Claims**

In a magnetic tape recording and/or reproducing apparatus, a device for giving an alarm sounds when the magnetic tape runs out in a tape reel. The device comprises a tension change sensing element adapted to sense a change in tension of the tape, a sound producing member and a rotating body which keeps on rotating even after the termination of the tape feeding, and is operative in such a manner that when the tape feeding is terminated, the tension change sensing element is displaced as a result of a change in tension of the tape at the end portion thereof, thereby bringing the sound producing member into engagement with the rotating body to produce an alarm sound.

3,660,811

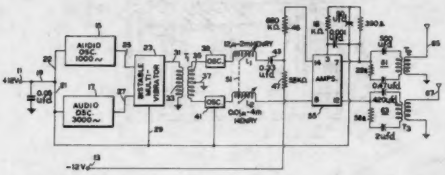
PROXIMITY WARNING TRANSMITTER FOR EMERGENCY VEHICLES

Evelyn W. Vail, and John Popik, both of Columbus, Ga., assignors to Alert, Inc., Columbus, Ga.

Filed Nov. 12, 1969, Ser. No. 875,668
Int. Cl. G08c *17/00*
U.S. Cl. 340—33 **6 Claims**

A transmitter, carried by an emergency vehicle, transmits directional jamming radiation to operating receivers of pas-

senger vehicles in its path. Different fixed frequency audio signals alternately modulate both an AM carrier and an FM carrier to provide a wobbling sound at either AM or FM receivers. The carrier frequencies are varied through their respective broadcast bands to scan up and down their



frequency spectrums so that the alarm is picked up by any receivers in the directional path of radiation regardless of the station to which it is turned. The carriers are caused to scan their broadcast spectrums by imparting reciprocating motion to slugs in inductor tuners in circuit with the respective oscillators, thereby varying the carrier frequencies.

3,660,812

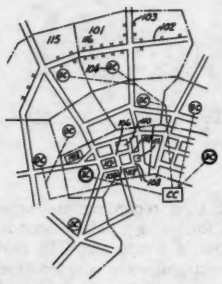
ROAD TRAFFIC CONTROL SYSTEM

Hiroshi Inose; Hiroya Fujisaki, and Takashi Hamada, all of Tokyo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation-in-part of application Ser. No. 631,056, Apr. 14, 1967, now abandoned. This application May 1, 1970, Ser. No. 33,826

Int. Cl. G08g *1/08*

U.S. Cl. 340—35 **9 Claims**



This invention provides an apparatus for effecting optimal road traffic control of a road network in a traffic area, such a traffic area being divided into a plurality of sub-areas and a district controller being provided in each sub-area. The district controller is provided to control the traffic in the sub-area, road network, establishing a preferential offset for two-way traffic for a tree pattern of the road network which includes no closed road loop, by considering the offset effect quantum for each road section between signals, and a split for each intersection and a common cycle length thereby minimizing the delay time in the sub-area as based on information from traffic detectors on the road and other road conditions. A Central Controller is provided for controlling traffic of the entire road network in the area by coordinating the district controllers as based upon the traffic pattern of the entire area.

3,660,813

CIRCUIT ARRANGEMENTS FOR THE INDICATION OF LAMP FAILURE

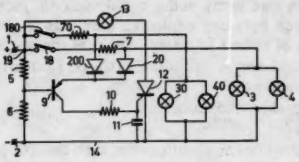
Paul Rumpf, Kew East, Australia, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 7, 1970, Ser. No. 26,205

Claims priority, application Australia, Apr. 8, 1969, 53156

Int. Cl. B60q *1/00*

U.S. Cl. 340—52 R **11 Claims**



An electric warning system for a pair of parallel-connected lamps includes a warning lamp in series with a thyristor across the system input terminals. A resistor is connected in a first series circuit with the lamps and in a second series circuit with a transistor and a capacitor across the input terminals. The transistor is biased to cut-off by means of second and third resistors in series across the input terminals. The circuit components are arranged so that failure of either lamp turns the transistor "on" to charge the capacitor. The capacitor voltage is coupled to the thyristor control electrode to trigger the thyristor "on" when a given capacitor voltage level is achieved. A switch is provided in the circuit so as to remove the input voltage from all of the circuit components except the thyristor and the warning lamp.

3,660,814

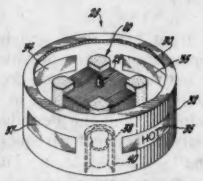
VEHICLE CONDITION RESPONSIVE MONITORING SYSTEM

Douglas I. Fales, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 20, 1970, Ser. No. 91,491

Int. Cl. G08b *19/00*

U.S. Cl. 340—52 F **4 Claims**



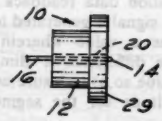
Apparatus for providing information as to a plurality of conditions using a single air core gauge. Each condition being monitored controls a switch that in turn controls the energization of at least one winding, the magnetic fields generated by the windings forming a resultant magnetic field that controls the orientation of an indicia-bearing rotatable disc. When one or more windings are energized a lamp illuminates the indicia that is located at a certain position by the disc so as to indicate the status of the condition which caused energization of the winding. A steering diode network permits the monitoring of more conditions than the number of windings employed in the gauge. A warning network provides an immediate indication of a change in a condition being monitored regardless of the position of the rotatable disc.

3,660,815

ABRASION WEAR WARNING DEVICE FOR VEHICLE BRAKES

Donald W. Rees, 12912 Leisure, Warren, Mich.

Filed Dec. 15, 1969, Ser. No. 885,170
Int. Cl. G08b 21/00
U.S. Cl. 340—52 A 7 Claims



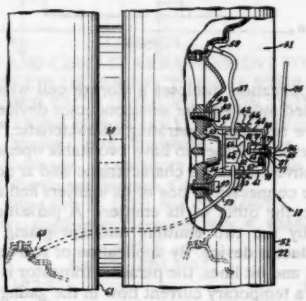
The present invention provides an abrasion wear warning device for indicating when a predetermined wear point has been reached in a monitored part undergoing wear by abraision, comprising a sensor means which is generally closed and part of an indicator circuit, but which upon wear of the monitored part to the predetermined wear point is opened thereby causing an indicator to be activated and to produce some visual, audible or other sensible reaction display to warn that the predetermined wear point in the monitored part has been reached.

3,660,816

TIRE CONDITION INDICATING SYSTEM

Forrest E. Barber, 9255 4th Avenue, Jacksonville, Fla.

Filed Feb. 4, 1970, Ser. No. 8,543
Int. Cl. B60c 23/04
U.S. Cl. 340—58 14 Claims



A low pressure indicating system for a vehicle including an electrical circuit having an indicator mounted on the frame and a switch pneumatically connected to the tire and responsive to a predetermined low pressure condition thereof. The switch is located within the tire rim cavity and rotatively connected to the tire assembly. A rotating brush is electrically connected to the switch and cooperates with a non-rotating shaft extending coaxial with the axle. An elongated electrical cable extends from the shaft outboard of the tire to the frame, such cable being rigid and extensible to permit upward and downward movement of the tire assembly with respect to the frame while inhibiting rotation of the shaft.

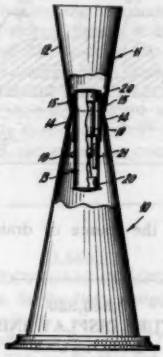
3,660,817

TRAFFIC MARKER HAVING GRAVITY SWITCH CONTROLLED HORN

Harvey E. Abrams, 56 Drewry Lane, Tappan, N.Y.

Filed Dec. 22, 1970, Ser. No. 100,630
Int. Cl. G08b 5/36, 5/38
U.S. Cl. 340—114 8 Claims

A conical type rubber traffic marker is converted into a bidirectional warning sound amplifier by installation of a horn or horns. A gravity switch is actuatable, in the event of



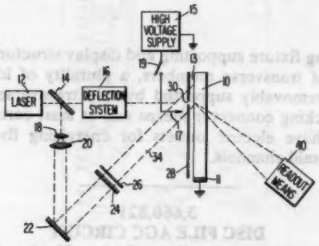
overturn, with the cone of traffic marker serving as a megaphone.

3,660,818

ELECTRO-OPTICAL MEMORY

Juan Jose Amodei, Langhorne, Pa., and Richard Williams, Princeton, N.J., assignors to RCA Corporation

Filed May 4, 1970, Ser. No. 34,118
Int. Cl. G11c 11/22, 13/04
U.S. Cl. 340—173 LS 10 Claims



Information is optically written onto the electrically charged surface of a transparent storage medium by directing light modulated with this information at this surface. The light partially discharges the charge and creates an electrical charge pattern which remains stored for long periods. The light either may be scanned across the surface to achieve sequential information storage or may be employed to write a large amount of information in parallel, for example in the form of a hologram. The stored information may be optically recovered by directing polarized light at the storage medium and employing a suitably oriented analyzer or, in the case of hologram storage, by wavefront reconstruction.

3,660,819

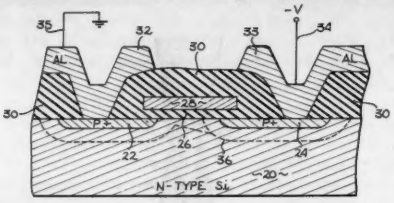
FLOATING GATE TRANSISTOR AND METHOD FOR CHARGING AND DISCHARGING SAME

Dov Frohman-Bentchkowsky, Los Altos, Calif., assignor to Intel Corporation, Mountain View, Calif.

Filed June 15, 1970, Ser. No. 46,148
Int. Cl. H01l 11/14
U.S. Cl. 317—235 R 9 Claims

A floating gate transistor comprising a floating silicon or metal gate in a field effect transistor which is particularly useful in a read-only memory is disclosed. The gate which is surrounded by an insulative material such as SiO_2 is charged

by transferring charged particles (i.e., electrons) across the insulation from the substrate during an avalanche (breakdown) condition in the source or drain junctions of the transistor.



3,660,820

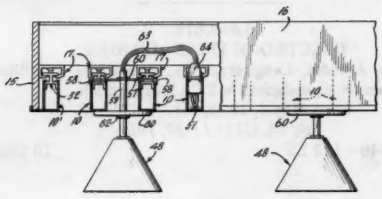
LIGHTING FIXTURE DISPLAY AND SUPPORTING STRUCTURE

Milton Liberman, 65 Seawane Rd., East Rockaway, N.Y.

Filed May 6, 1970, Ser. No. 35,028

Int. Cl. H01r *13/60*

U.S. Cl. 339—22 B **6 Claims**



A lighting fixture supporting and display structure having a plurality of transverse members, a plurality of longitudinal channels removably supported by said transverse members by interlocking connector means and at least certain of said channels have electric outlets for energizing fixtures supported by said channels.

3,660,821

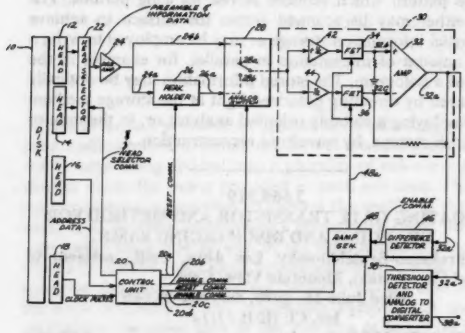
DISC FILE AGC CIRCUIT

Gunter R. Weber, Newbury Park; Charles E. Bickel, Thousand Oaks, and Richard W. Krueger, Oxnard, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed June 17, 1970, Ser. No. 46,912

Int. Cl. G11b *5/02, 5/44*

U.S. Cl. 340—174.1 H **16 Claims**



In a storage system having a moving magnetic recording surface, a method and apparatus for providing constant amplitude readback information data, regardless of the initial amplitude of the information data when read from the magnetic recording surface, utilizes an AGC feedback loop between a readback amplifier's output and input. Preamble data, preceding each recorded segment of information data is sampled and a signal indicative of the peak value thereof is fed into the amplifier. The amplifier output signal is compared with a reference signal representing the desired peak value of the information data readback. As long as a difference is detected, a signal is generated to vary the amplifier gain until it reaches a value wherein the difference is eliminated. Once the difference is eliminated, the gain is maintained at that value so as to insure constant information data readback amplitude for the segment of information data.

3,660,822

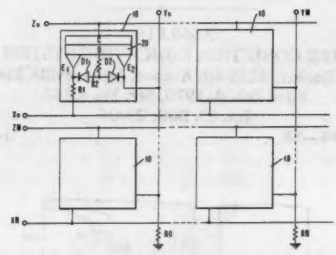
VARIABLE BREAKDOWN STORAGE CELL WITH NEGATIVE RESISTANCE OPERATING CHARACTERISTIC

Evan E. Davidson, Wappingers Falls, and Richard L. Moore, Liverpool, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 15, 1969, Ser. No. 885,152

Int. Cl. G11c *11/40*; H03k *17/24*

U.S. Cl. 340—173 NR **4 Claims**



This application discloses a storage cell which employs a single gated multi-emitter semiconductor device that exhibits a negative resistance operating characteristic. The semiconductor device is biased to have two stable operating states on this negative resistance characteristic and is addressed by a word line connected to one of its emitters and a bit line connected to the other of its emitters. A parasitic transistor is formed by the two emitters and the gating layer of the semiconductor device. By application of half-select pulses to the word and bit lines, the parasitic transistor is broken down to cause a temporary current flow in the gating region of the semiconductor device. While this current flows in the gating region, the operating characteristic of the semiconductor device is changed so that there is only one stable operating state for the semiconductor device. The operation of the semiconductor device therefore shifts to this single operating state. When the temporary current flow ends the semiconductor device will be in a low voltage, high current stable state along the negative resistance characteristic irrespective of the operating state of the semiconductor device prior to the application of the half select pulses. When such a storage cell is manufactured in monolithic form, very high cell densities and extremely high operating speeds are obtainable.

3,660,823

SERIAL BIT COMPARATOR WITH SELECTABLE BASES OF COMPARISON

John A. Recks, Lincoln, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

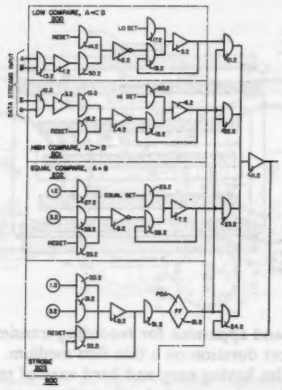
Filed July 20, 1970, Ser. No. 56,595

Int. Cl. G06f *7/02*

U.S. Cl. 340—146.2 **8 Claims**

A serial by bit comparator device is disclosed for determining the relative magnitude of two binary numbers. The com-

parator comprises a plurality of storage means for storing interrogating bits therein. Each storage means represents a proposition relative to the numbers to be compared, and the presence of an interrogating bit in a storage means signifies that the proposition for which that storage means represents



is true. The binary numbers to be compared are fed into the comparator, and depending on their relative magnitude, permit or inhibit the continued storage of the interrogating bit. Means are provided to sense in which of the storage means there still remains an interrogating bit, hence determining which proposition is true, or if a given proposition is true.

3,660,824

METHOD AND CIRCUIT ARRANGEMENT FOR THE SUPERVISION OF CONNECTIONS IN STORAGE-PROGRAMMED TELECOMMUNICATION SWITCHING INSTALLATIONS FOR BINARY, CODED MESSAGES

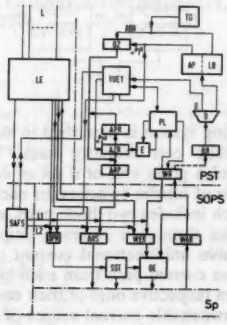
Hans-Ulrich Moder, and Bernhard Schaffer, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Feb. 5, 1970, Ser. No. 8,967

Claims priority, application Germany, Feb. 5, 1969, P 19 05 659.8

Int. Cl. G06f *9/02*

U.S. Cl. 340—172.5 **19 Claims**



A method and apparatus for the supervision of connections in storage-programmed telecommunication switching installations for binary coded messages is described. The information identifying transmitters to be supervised is recorded at permanently assigned storage locations such that the assigned location will be checked first. Only when the stored information demands supervision, the bit combination which is contained in the word stored therein, is checked in a program control and changed. The changed bits are recorded in each case during a single storage cycle through operations similar to the logic OR operation, taking place at the store itself, the changed bits being recorded into the assigned storage location. Therefore, only those transmitter cells are tested which are to be supervised, and erroneous over-writing is avoided.

3,660,825

ELECTRONIC COMPUTER

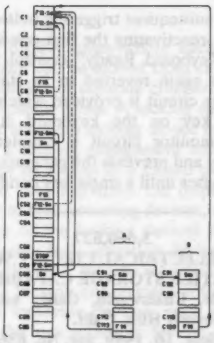
Giovanni De Sandre, Sacile, Italy, assignor to Ing. C. Olivetti & C.S.p.A., Ivrea, Italy

Continuation of application Ser. No. 717,110, Mar. 29, 1968, now abandoned. This application Feb. 5, 1971, Ser. No. 113,060

Claims priority, application Italy, Apr. 1, 1967, 51164 A/67

Int. Cl. G06f *9/16*; G05b *19/22*; G06f *15/02*

U.S. Cl. 340—172.5 **4 Claims**



In a program controlled electronic computer the address of the return point (or main program re-entry storage location) from a program subroutine to the main program is specified by information in a fixed address program storage location, which location is loaded by a special instruction placed in the main program ahead of the branching point. Each subroutine may be contained in an individual record card, which upon being fed into the computer causes said subroutine to be executed.

3,660,826

NOISE PROTECTION AND ROLLOVER LOCKOUT FOR KEYBOARDS

Stanley J. Lins, Minneapolis, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Oct. 2, 1970, Ser. No. 77,467

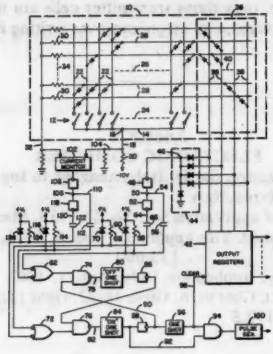
Int. Cl. G11c *11/36*

U.S. Cl. 340—173 R **5 Claims**

An electronic circuit for use with an operator keyboard for preventing erroneous data generation which may otherwise

occur because of contact bounce or by the substantially simultaneous closure of more than one key at a time. A pair of cross-coupled monostable multivibrators (one-shots) are coupled by coincidence circuits to the keyboard and keyboard encoder so as to control the generation of "-Keyboard Ready" control pulses.

The first contact closure of a single key causes one of the one-shots to trigger on and to generate a single "Keyboard Ready" pulse. It also locks out the second one-shot circuit



and prevents and subsequent triggering pulses caused by contact bounce from reactivating the first one-shot and producing additional "Keyboard Ready" control pulses until the first onetshot has again reverted to its stable state. Additionally, a monitor circuit is provided which senses whether more than one key on the keyboard is simultaneously depressed. This monitor circuit is coupled to the above described circuitry and prevents the generation of "Keyboard Ready" control pulses until a single key condition is restored.

3,660,827

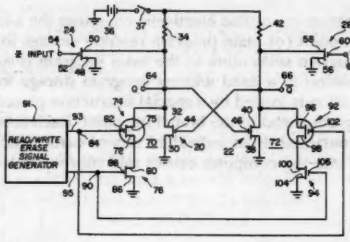
BISTABLE ELECTRICAL CIRCUIT WITH NON-VOLATILE STORAGE CAPABILITY

Andrew C. Tickle, Chatsworth, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Sept. 10, 1969, Ser. No. 856,607

Int. Cl. G11c *11/40*

U.S. Cl. 340—173 FF **23 Claims**



A bistable electrical circuit, such as a flip-flop, incorporating insulated-gate field-effect transistors as non-volatile memory elements. Read and write circuitry couple the memory elements to amplifying (switching) stages of the bistable circuit such that the state of the flip-flop, at the time a write signal is applied to the memory elements, is non-volatilely stored. Upon application of a read signal the flip-flop is initialized to a state which is a function of the state of the flip-flop during the writing mode of operation. Data storage is maintained in the absence of all applied power to the bistable electrical circuit.

3,660,828

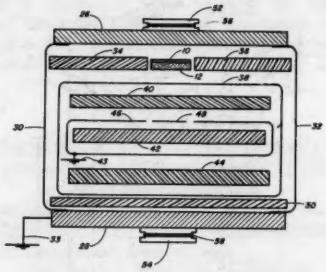
METHOD AND APPARATUS FOR RECORDING TRANSIENT SIGNALS

Henry R. Irons, Adelphi, and Leonard J. Schwee, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed Jan. 14, 1970, Ser. No. 2,757

Int. Cl. G11c *11/14*

U.S. Cl. 340—174 TF **9 Claims**



A method and apparatus for recording transient signals of extremely short duration on a thin film medium. A uniaxially anisotropic film having easy and hard axes of magnetization is located adjacent an input signal conductor and a scanning conductor. The scanning conductor is energized to produce a high intensity field which sweeps along the film parallel to its hard axis, while the input conductor applies the signal to be recorded to the film along its easy axis. The film may be exposed to a constant gradient field to insure that the recording faithfully represents the amplitude of the input signal.

3,660,829

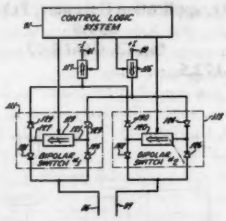
BIPOLAR CURRENT SWITCHING SYSTEM

George H. Wells, Santa Ana, and Perry B. Persons, Irvine, both of Calif., assignors to Technology Marketing, Incorporated, Santa Ana, Calif.

Filed July 15, 1970, Ser. No. 55,054

Int. Cl. G11c *5/02, 11/06*

U.S. Cl. 340—174 TB **5 Claims**



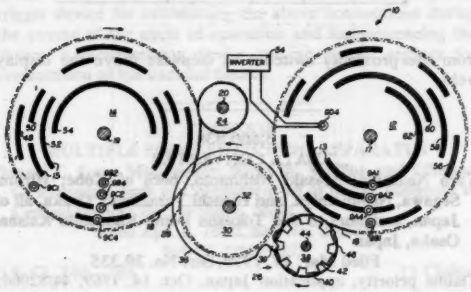
A current steering system is described in the context of a multi-plane magnetic core memory stack. The system is designed to control a given end of a set of core drive lines and includes a pair of bipolar switches for each pair of lines. Each bipolar switch includes two diode pairs, each pair being connected in series through a common unipolar switch to form two switchable unidirectional current paths for each bipolar switch. One current path from each bipolar switch is connected between respective ones of their associated pair of drive lines and a switchable current source of a given polarity. The remaining two current paths of the pair of bipolar switches are connected between the same two lines and a switchable current source of the opposite polarity. In this way both bipolar switches participate in controlling the flow of current in each of a pair of drive lines.

3,660,830

MULTI-ELEMENT SHAFT ENCODER INCORPORATING A GENEVA DRIVE

Fredrick W. Osborn, Purdy's Station; Geoffrey S. Hedrick, Bedford, and William A. Prasse, Bedford, all of N.Y., assignors to Lear Siegler, Inc., Armonk, N.Y.

Filed Aug. 18, 1969, Ser. No. 851,020
Int. Cl. G08c 9/06
U.S. Cl. 340—204 5 Claims



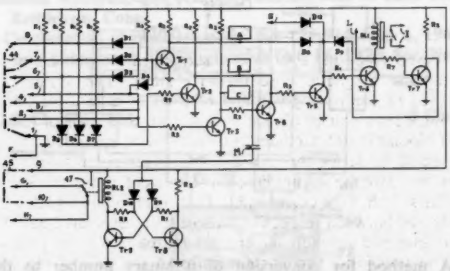
Digital encoder for an input variable represented by rotation of a shaft, as for encoding the altitude reading of an altimeter, comprising a pair of encoder discs having arcuate tracks or bit paths bearing rotational position indicia, and means for sensing the indicia, one of the discs being driven at a relatively low average speed by a geneva drive interposed between the input shaft and the low-speed disc. The low-speed disc carries higher order or coarse data. Using transparent encoder discs having opaque tracks thereon in the form of a conventional gray code, duplication of tracks having the same form but differing in phase is eliminated by utilizing two pickups separated at appropriate angular intervals along a single track. Where one cycle is complementary to another, two pickups may be used with a single track, one of the signals being fed through an inverter to obtain the proper resultant signal.

3,660,831

ELECTRONIC ANTITHEFT DEVICE USING AN ELECTRONIC SAFETY LOCK

Maurilio Nicola, and Ezio Luciano, both of Manta, Cuneo, Italy, assignors to Maezelectronics, S.n.c. di Luciano' & Nicola, Manta, Cuneo, Italy

Filed Apr. 2, 1970, Ser. No. 25,231
Claims priority, application Italy, Apr. 2, 1969, 51269 A/69
Int. Cl. E05b 45/10; H01h 9/28, 27/00
U.S. Cl. 340—274 12 Claims



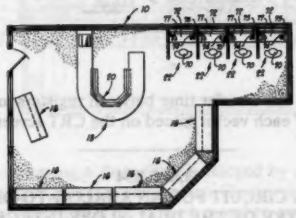
An antitheft device operated by a key containing electronic contacts insertable into a lock comprising electronic circuitry, the contacts being uniquely arranged to actuate the electronic circuitry. The keyhole has two positions such that insertion of the key into the first position actuates the circuitry into a pre-alarm state wherein any unauthorized tampering with the system will sound an alarm. Insertion of the key into the second position deactivates the electronic circuitry.

3,660,832

APPARATUS FOR MERCHANDISING SMALL MERCANTILE ITEMS

Thomas C. Hoshall, P. O. Box 14100, Oklahoma City, Okla.

Filed Mar. 19, 1970, Ser. No. 21,124
Int. Cl. G08b 21/00
U.S. Cl. 340—280 6 Claims



A plurality of display cases where each display case includes a door which can be moved from an open to a closed position and a plurality of separate compartments therein for receiving the mercantile items. A locking device is secured to each display case and each locking device is adapted to move into and out of a locking engagement with the door, such that the door may be locked in a closed position. A control panel is disposed remotely from the display cases and includes a plurality of lock actuating devices, each of which are connected to one of the locking devices in a display case, such that a particular lock actuating device can actuate the locking device in the case, thereby moving the locking device into and out of a locking engagement with the door; and a plurality of lock indicator devices, each of which is connected to one of the lock actuating devices, and is adapted to provide a visual indication that the locking device has been moved out of a locking engagement with the door.

3,660,833

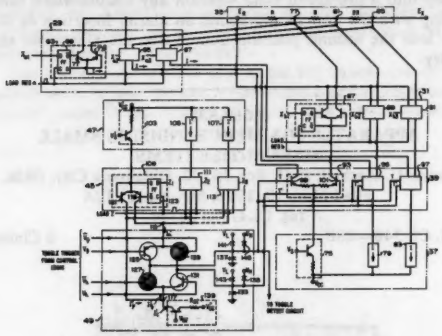
SYSTEM FOR PRODUCING CHARACTERS ON A CATHODE RAY TUBE DISPLAY BY INTENSITY CONTROLLED POINT-TO-POINT VECTOR GENERATION

Walter T. Blejwas, Jr., 1056 Brown Road, Somerville, N.J.; Anthony R. Kaseta, 6 Runnymede Road, Clark, N.J., and Rene Colen, 525 Stony Brook Drive, Somerville, N.J., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 11, 1970, Ser. No. 36,054
Int. Cl. G06f 3/14
U.S. Cl. 340—324 A 12 Claims

An alpha-numeric character generating system receives digital codes representing characters and controls a CRT to trace a plurality of vectors which in combination form the characters displayed. A read-only memory provides in sequence a plurality of sets of X, Y and Z parameters for each character. Succeeding X and Y parameters are each stored in corresponding alternate registers. The sets of X and Y parameters define the end points of the vectors forming a character. Two digital to analog converters responsive to the X and Y parameters, respectively, provide signals for deflecting the CRT beam. The inputs of the digital to analog converters are transferred between corresponding alternate registers to cause the CRT beam to trace from one vector end

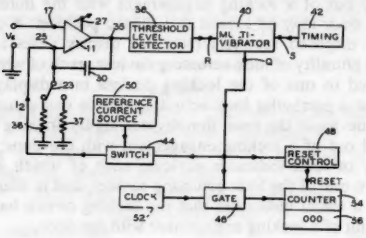
point to the next in sequence. A toggle circuit responsive to the Z parameter associated with each set of X and Y parameters controls the transfer time between registers and thus the brightness of each vector traced on the CRT screen.



3,660,834
ANALOG CIRCUIT FOR AN ANALOG-TO-DIGITAL CONVERTER OF THE DUAL-SLOPE INTEGRATING TYPE

Clement Picot, Massy, France, assignor to Societe D'Instrumentation Schlumberger, Paris, France

Filed May 25, 1970, Ser. No. 40,173
Claims priority, application France, May 28, 1969, 6917334
Int. Cl. H03k *13/20*
U.S. Cl. 340—347 NT **5 Claims**



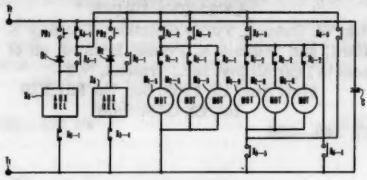
The analog circuit portion of an analog-to-digital converter of the dual-slope integrating type is comprised of a single, high gain differential amplifier having signal inverting and signal noninverting inputs and an integrating capacitor coupling the amplifier output to the inverting input. Analog signal is applied to the noninverting input to charge the capacitor and reference signal is selectively applied to the inverting input to discharge the capacitor. The range of measurement is determined by a resistor having one end connected to the amplifier inverting input and the opposite end connected to a constant potential source.

3,660,835
DESTINATION DISPLAY APPARATUS

Ishi Habuka; Kazuko Habuka, and Takashi Habuka, all of No-23-8, 3-chome, Sengoku, Bukyo-ku, Tokyo, Japan

Filed Apr. 7, 1970, Ser. No. 26,223
Int. Cl. G08b *23/00*
U.S. Cl. 340—325 **2 Claims**

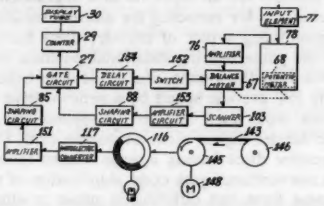
Destination display webs mounted on various portions of a vehicle are operated in the same manner by providing a plurality of position detection elements for respective display sections of the display webs, a plurality of proximity switches — associated with respective webs to detect position detection elements and a control circuit responsive to the output from the proximity switches to stepwise move the display webs.



3,660,836
DATA CONVERTER

Taro Nakatani; Masaki Nishimoto, both of Kobe; Hiromi Segawa, Nishinomiya, and Hiroshi Yamamoto, Osaka, all of Japan, assignors to Toa Tokushu Denki Kabushiki Kaisha, Osaka, Japan

Filed Mar. 17, 1970, Ser. No. 20,335
Claims priority, application Japan, Oct. 14, 1969, 44/82064; Mar. 17, 1969, 44/20712
Int. Cl. G08c *9/06*
U.S. Cl. 340—347 R **11 Claims**

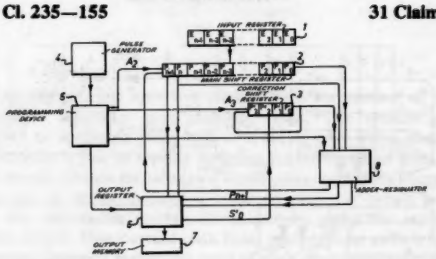


A data converting apparatus cooperating with a function pattern containing information of a given function; the scanner is to be actuated a distance corresponding to the axis of the independent variable and the corresponding value on the function pattern is detected for conversion to provide a numerical readout.

3,660,837
METHOD AND DEVICE FOR BINARY-DECIMAL CONVERSION

Jean Pierre Chinal, 6, Rue Felicien-David, Paris 16 , Seine, France

Continuation of application Ser. No. 594,873, Dec. 16, 1966, now abandoned. This application Aug. 10, 1970, Ser. No. 62,637
Int. Cl. H03k *13/24*
U.S. Cl. 235—155 **31 Claims**



A method for conversion of a binary number to the decimal system utilizing division of the binary number by 2 with storage in memory of the remainder corresponding to the binary figure of smaller order of the number and a sequence of operations on the quotient to effect division by 5

so as to obtain at each sequence a number associated with the quotient of successive divisions by 10 of the number to be converted, and a number associated with the remainder of this same division, the remainder then constituting a decimal figure of the converted number.

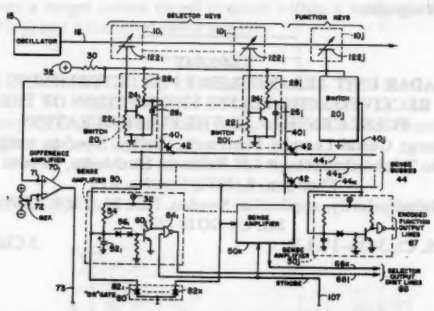
A conversion device constituted by a counter of elementary times or a clock, an input register with n bits positions, a main shifting register with $n + 2$ bits positions, a correction shifting register with four positions of bits for formation of the correction in finding the true quotient of division by 5, a series adder with variable connections and a carry-over trigger device for establishing the above connections during the course of the cycle of operation and for sequencing the device, a programming device and an output register for presentation of the decimal figures.

3,660,838

MULTIPLE POINT SWITCHING APPARATUS

Donald C. Gove, Manchester; Barry W. Mullins, and Edmund G. Rousseau, both of Chelmsford, all of Mass., assignors to Control Devices Inc., Woburn, Mass.

Filed Apr. 2, 1970, Ser. No. 25,088
Int. Cl. G08c 9/02
U.S. Cl. 340—365 **11 Claims**



A multiple point switching array employs a plurality of keys for effecting a variable capacitance coupling between an oscillator and oscillation-responsive semiconductor switching circuits. The output of the semiconductor switches are encoded onto a plurality of sense buses, and connected therefrom to output digit lines via a plurality of sense amplifiers.

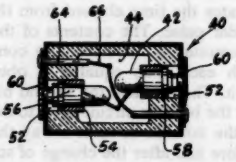
A strobe circuit is provided to simultaneously enable the sense amplifiers after their switching thresholds have been exceeded, and circuitry is employed to inhibit all outputs when more than one key is actuated at any one time.

3,660,839

REMOVABLE ANNUNCIATOR LAMP BLOCK

Samuel Wittman, and Marcel Wittman, both of Lake Drive, Bethlehem, Conn.

Continuation of application Ser. No. 726,916, May 6, 1968, now abandoned. This application Oct. 16, 1970, Ser. No. 81,490
Int. Cl. G08b 5/00
U.S. Cl. 340—381 **5 Claims**



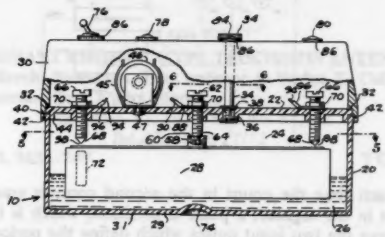
An annunciator lamp block which includes a color filter laminated thereto, indicia markings on said filter, one or more lamps within the lamp block, and spring contacts between the lamps and the annunciator circuit.

3,660,840

LEVEL INDICATOR DEVICE

James Michael Plofchan, 15410 Rockdale Ave., Detroit, Mich.

Filed May 25, 1970, Ser. No. 39,970
Int. Cl. G01f 23/00
U.S. Cl. 340—421 **5 Claims**



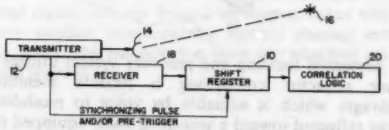
A reservoir having a float therein buoyed by a liquid into engagement with a center pivot point. Electrical contacts on the four corners of a cross-shaped member carried by the float are engageable with four associated contacts fixed to the reservoir and each connected to a signal light such that when the reservoir is not level one or more of the lights are energized thereby indicating the direction of inclination of the reservoir.

3,660,841

APPARATUS AND METHOD FOR ADJUSTING THE INDEXING RATE OF A FIXED LENGTH SHIFT REGISTER

Allen E. Powers, Canoga Park, and Robert Segal, Pacific Palisades, both of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Sept. 8, 1969, Ser. No. 856,120
Int. Cl. G01s 9/02
U.S. Cl. 343—5 DP **18 Claims**



A means and method for adjusting the indexing rate of a fixed length shift register to cause the register to index through its entire length during one period between variably spaced trigger pulses, the shift register being clocked at different clocking rates.

3,660,842

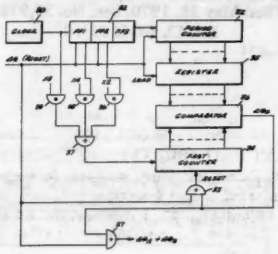
AZIMUTH INTERPOLATOR

Jack R. Ballantyne, Santa Ana, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 25, 1970, Ser. No. 40,014
Int. Cl. G01s 9/52
U.S. Cl. 393—16 R **10 Claims**

An azimuth interpolator is disclosed which receives as an input a sequence of a fixed number of azimuth change pulses for each revolution of a rotating antenna. The time periods between adjacent pairs of the input pulses are assumed to be nearly, but not necessarily, equal. The interpolator includes a

first counter which measures the time period between each pair of pulses by accumulating a count which is related to the measured period. At the end of the measured period, the count is transferred to a register which holds the count while the first counter measures a succeeding period. During the latter period, a second counter is clocked at a rate which is greater than the clocking rate of the first counter by a factor



X. Each time the count in the second counter equals the count in the register, a pulse is produced which is inserted between the two input pulses which define the period being measured. The interpolator includes an inhibit structure which prevents the X^{th} pulse from being inserted either immediately before or after the input pulse which defines the end of the period which is being measured.

3,660,843

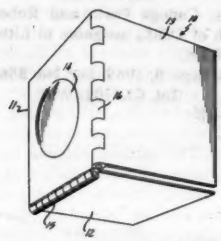
RECOVERY SYSTEM

Hanns H. Wolff, Orlando, Fla., assignor to The United States of America as represented by the Secretary of the Navy

Filed Aug. 31, 1970, Ser. No. 68,281

Int. Cl. HO1q *15/20*

U.S. Cl. 343—18 C **8 Claims**



A personnel locating and recovery system utilizes a radar corner reflector comprising a flexible membrane or diaphragm which is actuable by voice to modulate radar energy reflected toward a searching radar equipped to detect the modulation for recognition and identification purposes. In a preferred embodiment the reflector is foldable to pocket size.

3,660,844

RADAR DETECTOR AND IDENTIFIER

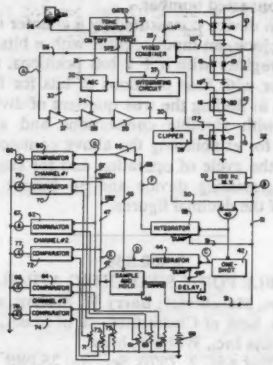
Basil E. Potter, Williamsville, N.Y., assignor to Sierra Research Corporation

Filed May 4, 1970, Ser. No. 34,296

Int. Cl. G01s *7/40*

U.S. Cl. 343—18 E **8 Claims**

A radar detector and identifier device described with reference to an illustrative embodiment wherein the device is carried and used by persons, such as military personnel, to warn them when they are being illuminated by radar, to provide such persons with the capability of roughly determing the direction from which the radar illumination is coming, and especially to provide them with the capability of identifying the radar signal as originating from an enemy or a friendly source by identifying certain characteristics of the



radar signal itself such as its pulse repetition frequency and its pulse width, the device also being operative to recognize CW signals.

3,660,845

RADAR UNIT ARRANGEMENT FOR DETERMINING IN RECEIVED ECHO PULSES THE POSITION OF THE PULSE CENTER AND THE PULSE DURATION

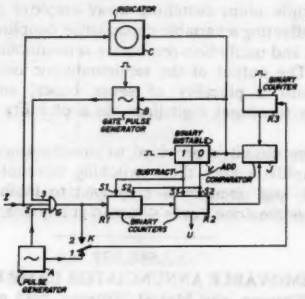
George Gustaf Lennart Pettersson, Skalby, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Jan. 5, 1970, Ser. No. 619

Claims priority, application Sweden, Feb. 26, 1969, 2589/69

Int. Cl. GO1s *7/28*

U.S. Cl. 343—17.1 R **3 Claims**

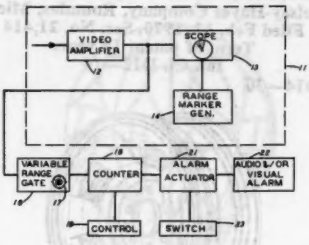


A radar unit arrangement for determining the position of the pulse center and the pulse duration of the received echo pulses. The echo pulses gate a number of subpulses to a first binary up-down counter which counts the subpulses. A second binary up-down counter receives a pulse from the first each time a certain value is exceeded. A third binary counter indicates the time elapsed from the moment of the emitting a radar pulse. The contents of the second and the third binary counter are continuously compared in a comparator which each time equality is obtained activates a bistable circuit. The first and the second binary counters are controlled by the bistable circuit so as to switch the counting direction of the counter in such a way that the number of subpulses before and after the change of state of the bistable circuit will be the same.

3,660,846
AUTOMATIC COLLISION WARNING SYSTEM

Lawrence F. Anderson, 818 North Delaware Ave., #402, San Mateo, Calif.

Filed Oct. 23, 1969, Ser. No. 868,806
Int. Cl. G01s 9/02
U.S. Cl. 343—7 ED 6 Claims

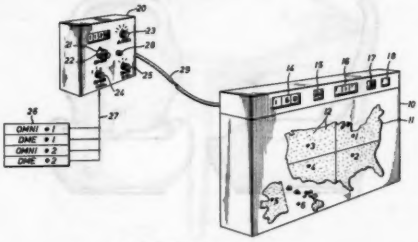


A simplified collision warning system particularly applicable for ships and automatically producing an alarm signal upon the persistence of an object within a predeterminable range. The video output of conventional radar is employed with a variable range gate and counter to actuate an alarm when a target return signal remains within a set gate range for a preset number of radar sweeps.

3,660,847
AIRCRAFT POSITION DISPLAY

Harry C. Danaher, Houston, Tex., assignor to The Superior Oil Company, Houston, Tex.

Filed Aug. 30, 1968, Ser. No. 756,660
Int. Cl. G01s 5/02
U.S. Cl. 343—112 PT 20 Claims

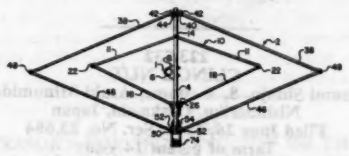


An onboard position display for aircraft, including a map located in the passenger compartment with lights on the map corresponding to Omni stations. A control unit operated by the pilot activates one of the lights, representing the Omni station used for navigation. The control unit includes a frequency select dial which is set on the same frequency used at the time for the Omni receiver. DME and To-From indications are also provided. A memory device permits a series of the lamps to be lighted representing the flight path, with the lamp for the closest station blinking.

3,660,848
RESONANT RHOMBIC TYPE TELEVISION ANTENNA

John Kerch, Bomarton, Tex., assignor to Verlan D. Coffman, Bomarton, Tex., a part interest

Filed Aug. 17, 1970, Ser. No. 64,461
Int. Cl. H01q 21/12
U.S. Cl. 343—749 7 Claims

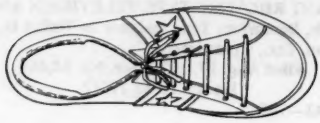


A television antenna utilizing vertically spaced apart sets of rhombics arranged in parallel horizontal planes, one rhombic within another rhombic in the same plane which rhombics are so connected as to get the entire range of television bands from 54 to 216 megacycles with one set of rhombics being resonant to the midband of the low segment of the band, and another set of rhombics being resonant to the midband of the high segment of the band. The antenna rhombics are center grounded to a metallic ground, such as a boom or mast and is lightning proof, due to the grounded construction of the rhombics. The rhombic antenna has high sensitivity in picking up television color pictures and has long range with a high gain. The sets of rhombics lie in vertical, spaced apart horizontal planes and are braced by support tubes with one set above another connected by vertical phasing network tubes to which the transmission lines are attached mediate the length thereof.

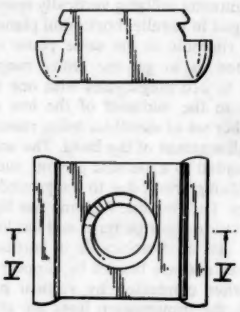
DESIGNS

MAY 2, 1972

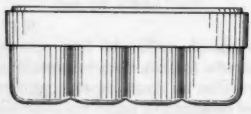
223,531
ATHLETIC SHOE
Daniel J. McCarthy, Somerville, Mass., assignor to Converse Rubber Corporation, Malden, Mass.
Filed Aug. 13, 1969, Ser. No. 18,674
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310



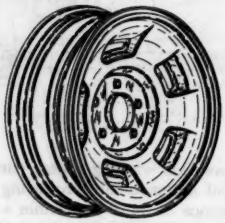
223,532
CLINCH NUT
Katsumi Shinjo, 8, 6-chome, Asahi Minomidori, Nishinariku, Osaka-shi, Japan
Filed June 26, 1970, Ser. No. 23,684
Term of patent 14 years
Int. Cl. D8—*10*
U.S. Cl. D8—274



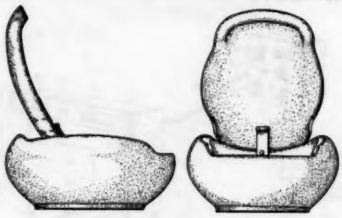
223,533
INSULATED CONTAINER
Kenneth A. Mitchell, 4704 Stevens Ave. S., Minneapolis, Minn. 55409
Filed June 26, 1970, Ser. No. 23,686
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—179



223,534
WHEEL
Donald J. Reid, Pleasant Ridge, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.
Filed Feb. 12, 1970, Ser. No. 21,414
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—30



223,535
CHAIR
Peter Ghyczy, Stettiner-Str. 6, 2844 Lemfoerde, Hannover, Germany
Filed Mar. 23, 1970, Ser. No. 22,015
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D15—1

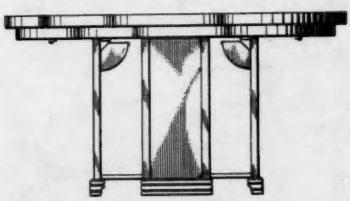


223,536
COMBINED WALKER AND TRAY FOR A CHILD
Shoichi Itoh, Tokyo, Japan, and Elmer Rocker, Shaker Heights, Ohio, assignors to Century Products, Inc., Cleveland, Ohio
Filed May 4, 1970, Ser. No. 22,808
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D15—1

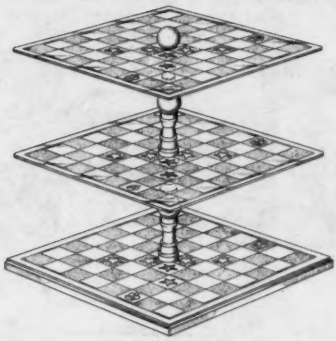
223,537
ELECTRIC LAMP BULB
Harold Charles Fishbein, 1267 S. Barry Ave., Los Angeles, Calif. 90025
Filed May 20, 1970, Ser. No. 23,062
Term of patent 14 years
Int. Cl. D26—*04, 05*
U.S. Cl. D26—8

223,538
TABLE
James P. Manning, Deerfield, Ill., assignor to Republic Molding Corporation, Niles, Cook County, Ill.
Filed Oct. 12, 1970, Ser. No. 25,461
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D33—14

223,539
CONVERTIBLE TABLE FOR UTILITY, GAMES, AND BUMPER POOL
Ernest Milu, Hollywood, Fla., assignor to All Tech Industries, Inc., Miami, Fla.
Filed May 17, 1971, Ser. No. 144,382
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—3

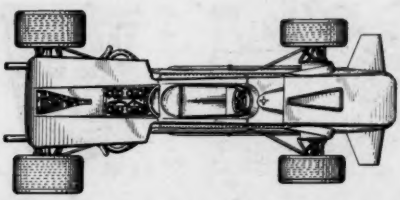


223,540
THREE DIMENSIONAL GAME BOARD
Jerry P. Kayle, Sherman Oaks, Calif., assignor to Pacific Game Co., Inc., North Hollywood, Calif.
Filed July 6, 1970, Ser. No. 23,839
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5

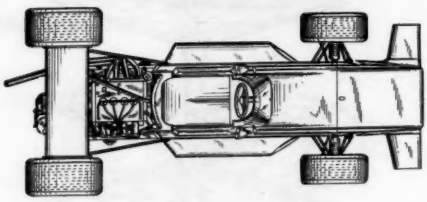


223,541
ACCESSORY FOR SPINNING TOY OR THE LIKE
Richard L. Shield, Long Beach, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed June 8, 1970, Ser. No. 23,373
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

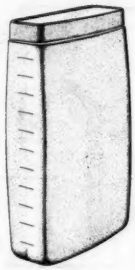
223,542
MODEL RACING CAR
Leonard Edward Terry, Wimborne, England, assignor to Leda Cars Limited, Balena Close, Creekmoor, Poole, Dorsetshire, England
Filed July 1, 1970, Ser. No. 23,797
Claims priority, application Great Britain Jan. 1, 1970
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—15



223,543
MODEL RACING CAR
Robert John Herd, Milton Malsor, England, assignor to March Engineering Limited, Bicester, Oxfordshire, England
Filed July 30, 1970, Ser. No. 24,222
Claims priority, application Great Britain Jan. 30, 1970
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

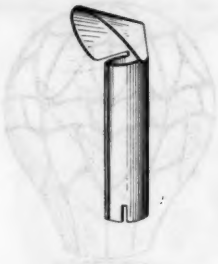


223,544
CANISTER
Kurt Sager, Basel, Switzerland, assignor to Ciba-Geigy AG., Basel, Switzerland
Continuation-in-part of design application Ser. No. 18,532, Aug. 4, 1969. This application Nov. 6, 1969, Ser. No. 19,967
Claims priority, application Switzerland Feb. 11, 1969
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—6



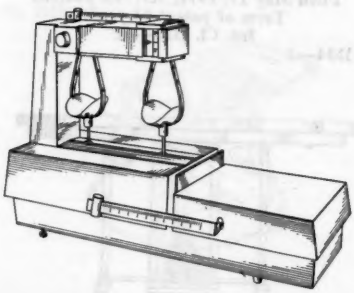
223,545
RING
David Raab, 1500 Bay Road, Apt. 547, and Samuel Goldstein,, 1500 Bay Road, Apt. 1097, both of Miami Beach, Fla. 33139
Filed Aug. 7, 1970, Ser. No. 24,371
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—10

223,546
FLOOR LAMP
Sergio Gandini, Via Tosio 20, Brescia, Italy
Filed June 25, 1970, Ser. No. 23,668
Claims priority, application Italy Dec. 31, 1969
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20



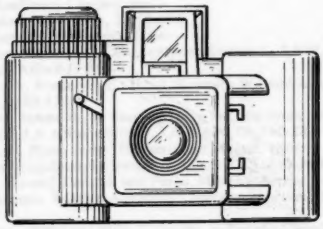
223,547
DESK LAMP
Ryuji Ohwa, Nara, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Aug. 27, 1970, Ser. No. 24,730
Claims priority, application Japan Mar. 2, 1970
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20

223,548
SCALE
Earl D. Myers, Westfield, N.J., and Samuel S. Leotta, Jenkintown, Pa., assignors to Ohaus Scale Corporation, Florham Park, N.Y.
Filed Nov. 19, 1970, Ser. No. 26,081
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—10

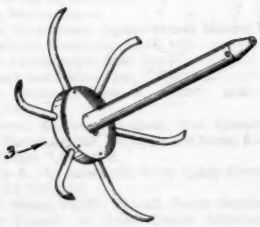


223,549
OSCILLOSCOPE CAMERA HOOD
Billy H. Vinson, San Diego, Calif., assignor to Integrated Controls, Inc.
Filed Sept. 14, 1970, Ser. No. 24,972
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1

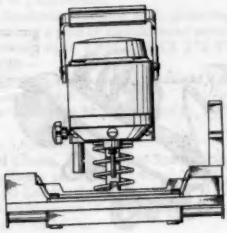
223,550
CAMERA
Ernest Camuso, Irvington, N.J., assignor to GAF Corporation
Filed Jan. 25, 1971, Ser. No. 109,750
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D61—1



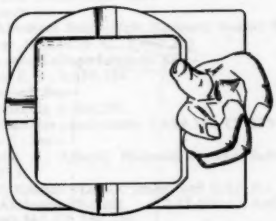
223,551
ANCHOR FOR BOATS
Laverne O. Persinger, Burbank, Calif., assignor of fractional part interest to Merle L. Persinger
Filed Nov. 28, 1969, Ser. No. 20,297
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D71—1



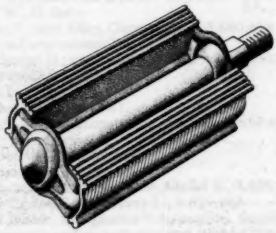
223,552
PUNCH
Norihito Tanaka, Osaka, Japan, assignor to Lihit Industrial Co., Ltd., Osaka, Osaka Prefecture, Japan
Filed Dec. 11, 1969, Ser. No. 20,465
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—1



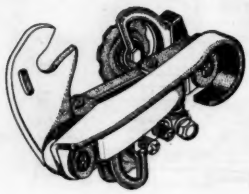
223,553
ASHTRAY
Manuel Valverde, 419 E. 10th St., Seymour, Ind. 47274
Filed Sept. 16, 1969, Ser. No. 19,166
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D85—2



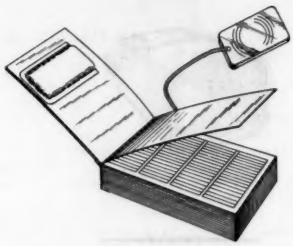
223,554
REFLECTIVE BICYCLE PEDAL
Carlton P. Pawsat, Maysville, Ky., assignor to Wald Manufacturing Company, Inc., Maysville, Ky.
Filed Mar. 2, 1970, Ser. No. 21,704
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D90—14



223,555
SPEED CHANGE GEAR FOR BICYCLES
Norio Sato and Takuo Ishida, both % Shimano Industrial Co., Ltd., 77, 3-chome, Oimatsu-cho, Sakai, Osaka Prefecture, Japan
Filed Sept. 10, 1969, Ser. No. 19,085
Claims priority, application Japan Mar. 26, 1969
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D90—17



223,556
COMBINED ADDRESS BOOK AND MAGNIFYING LENS
Richard-Wilhelm Heydemann, Via Tagliaferri Blocco A, CH–6911 Campione-Lugano, Switzerland
Filed Feb. 2, 1970, Ser. No. 21,211
Claims priority, application Germany Oct. 28, 1969
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D97—2



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 2D DAY OF MAY, 1972

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AB Ferrosan: *See—*
Abramo, Aina Lisbeth; Bjorklund, Rolf; Borretzen, Bernt; Olsson, Knut Gunnar; and Sundbeck, Bertil, 3,660,501.

AB Inventing: *See—*
Wallsten, Hans I., 3,659,347.

AB Purac: *See—*
Malm, Lars G., 3,659,720.

Abbott Laboratories: *See—*
Von Esch, Anne Mary; and Crovetti, Aldo Joseph, 3,660,390.

Abegg, Moroni Taylor; and Leslie, William B., to United States of America, Atomic Energy Commission. High temperature detonator. 3,659,527, Cl. 102-28.000

Abernathy, Robert G., to Avco Corporation. Combination rivet installation apparatus and self-drilling rivet. 3,659,449, Cl. 72-391.000

Abramo, Aina Lisbeth; Bjorklund, Rolf; Borretzen, Bernt; Olsson, Knut Gunnar; and Sundbeck, Bertil, to AB Ferrosan. Metal-organic compounds. 3,660,501, Cl. 260-613.00d

Abrams, Harvey W. Traffic marker having gravity switch controlled. 3,660,817, Cl. 340-114.

Abrosimov, Nikoloi Nikitovich: *See—*
Vasilkovsky, Lev Fedorovich; Sjusjuk, Vladimir Efimovich; Abrosimov, Nikoloi Nikitovich; Geidebrekhov, Georgy Andreevich; Lyashenko, Vsevolod Andreevich; and Podmogilny, Vladimir Ivanovich,3,659,642.

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ACF Industries, Incorporated: *See—*
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Ackerman, Alfred J.: *See—*
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Ackerman, James H., to Sterling Drug Inc. Bis cyclic imides of 3-substituted 2,4,6- triiodoanilines. 3,660,408, Cl. 260-281.

Ackermann, Hans; Seiler, Herbert; and Meindl, Hubert, to Ciba-Geigy AG. Anthraquinonyl-triazines. 3,660,393, Cl. 260-249.

Ackroyd, Ronald Tunstal; and Perks, Maurice Arthur, to United Kingdom Atomic Energy Authority. Nuclear reactors. 3,660,227, Cl. 176-17.

Adachi, Haruhiko; and Miki, Takuichi, to Takeda Chemical Industries, Ltd. Alkylbenzoylcarbinol phosphate esters. 3,660,542, Cl. 260-946.

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Agonis, Henry A., to Anaconda Wire Cable Company. Coil pay off. 3,659,802, Cl. 242-128.

Ahlberg, Erik Johan Victor; Ekwall, Gosta Bernhard; and Lindqvist, Rolf Artur Ronald, to Atlas Copco Aktiebolag. Independently rotated pneumatic rock drill. 3,659,657, Cl. 173-105.

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Akzona Incorporated: *See—*
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Alago, Edward. Mattress panel cutter. 3,659,766, Cl. 225-94.000

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Allen, Laird R., Jr., to Westinghouse Electric Corporation. Synchronous-type circuit breaker having two independently-operable mechanism. 3,660,625, Cl. 200-148.

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Allison, David Frank, to Signetics Corporation. Semiconductor structure with dielectric and air isolation and method. 3,660,732, Cl. 317-234.

Allsup, Oliver L. Stock for shoeing animals. 3,659,653, Cl. 168-44.

Alms, Erhard E.; and Mitchell, James E., said Mitchell assor. to AFE Industries, Inc. Clean-out means for grain dryer. 3,659,351, Cl. 34-174.

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Shoemaker, Arthur H., 3,659,923.
Shoemaker, Arthur H., 3,659,924.
Shoemaker, Arthur H., 3,659,925.

Ammon, John Preston; and Inacker, Frederick T., to Elfab Corporation. Multi-layer printed circuit boad and method of manufacture. 3,660,726, Cl. 317-101.

Amodei, Juan Jose; and Williams, Richard, to RCA Corporation. Electro-optical memory. 3,660,818, Cl. 340-173.

AMP Incorporated: *See—*
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Anderson, Robert E.; and Bachman, Augustus W., Jr. Process for bonding preheated thermoplastic film to a dissimilar substrate. 3,660,200, Cl. 156-306.

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Anner, Georg; and Kalvoda, Jaroslav, to Ciba Corporation. 3,16α,17α-Trihydroxy-$\Delta^{1,3,5(10)}$-oestratriene. 3,660,435, Cl. 260-397.5

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Arata, Akimasa: *See—*
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Arouete, Jean. Haemostatic apparatus for operations on the head of human beings. 3,659,609, Cl. 128-325.

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Atlas Copco Aktiebolag: *See—*
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Atwood, John G.; and Kerr, Edwin L., to Perkin-Elmer Corporation, The. Laser excited spectrophone. 3,659,452, Cl. 73-23.000

Auberry, Horace R.; and Liebscher, Anton, to Ro-Search, Incorporated. Footwear with method and device for its manufacture. 3,659,301, Cl. 12-133.000

Aubin, Adelard L., Jr. Wall mounted combination chalkboard, projector screen and information display apparatus. 3,659,355, Cl. 35-62.000

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Baker, Don R., to Stauffer Chemical Company. Use of certain oxime esters in controlling fungi upon cellulosic materials. 3,660,580, Cl. 424-327.000

Baker, Eric William. Seed sheets. 3,659,396, Cl. 53-180.

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Ball, Jeremy T., to Chrysler Corporation. Steering column lock inhibitor. 3,659,443, Cl. 70-186.

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Baranyi, Jozsef; and Lakatos, Laszlo, to Licencia Talalmanyokat Ertekesito Vallalat. Instrumental method and equipment for the determination of the degree of maturity in fruit, particularly in pomaceous fruit. 3,660,034, Cl. 23-230.

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Barochovsky, Antonin; Horacek, Ladislav; Krulik, Zdenek; Snitily, Miloslav; Stancl, Frantisek; and Wilfert, Milos, to Vyzkumny Ustav Bavlnarsky. Spinning machine and method. 3,659,410, Cl. 57-58.890

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Barski, Jakier. Cone holder. 3,659,803, Cl. 242-130.1

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Cusic, John W.; and Yen, Chung Hwai, to Searle, G. D., & Co. Fluorene-9-carboxylic acid hydrazides. 3,660,485, Cl. 260-558.
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Dahlgren, Jens Karl Adolf, to Stenberg-Flyget AB. Self-coupling pump unit. 3,659,964, Cl. 417-360.

Daido Seiko Kabushiki Kaisha: *See—*
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Danly, Donald E.; and Patterson, Andrew M., Jr., to Monsanto Company. Process of removing hydrolyzed polyacrylonitrile from an aqueous mixture. 3,660,258, Cl. 204-73.

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Davidson, Evan E.; and Moore, Richard L., to International Business Machines Corporation. Variable breakdown storage cell with negative resistance operating characteristic. 3,660,822, Cl. 340-173.

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Davison, Joseph W., to Phillips Petroleum Company. Isoprene from mixture of C_5-paraffins and olefins by one-step oxidative dehydrogenation with isomerization of recycle n-amylenes. 3,660,513, Cl. 260-680.

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De Geeter, Pieter J., to Shell Oil Company. Method and apparatus for burying pipeline. 3,659,425, Cl. 61-72.4

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Depoorter, Henri; Rillaers, Guy Alfred; Verhille, Karel Eugeen; and Ghys, Theofiel Hubert, to Gevaert-Agfa N.V. Spectral sensitization of photoconductive compositions with pyrrol or indolizinyl cyanine dyes. 3,660,085, Cl. 96-1.7

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De Stephan, Joseph J., to Thomas & Betts Corporation. Connector. 3,660,806, Cl. 339-256.0sp

Detch, Lewis. Lamp seal means. 3,660,800, Cl. 339-94.

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Kojima, Noriatsu. Coupling construction and improved packing ring therefor. 3,659,883, Cl. 285-348.
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Kunioka, Kazuo; Shimizu, Shigenari; and Hirata, Masaru, to Nippon Kokan Kabushiki Kaisha. Method for cooling steel materials. 3,659,428, Cl. 62-64.000

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Lachambre, Jean L., to Canada, Her Majesty the Queen in the right of, as represented by the Minister of National Defence of Her Majesty's Canadian Government. Ballistic joule meter for measuring a pulse of infrared radiation. 3,660,661, Cl. 250-83.30h

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La Soudure Electrique, Precedes Arcos: *See—*
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Laubenstein, Priscilla. Multisensory learning aid device. 3,659,359, Cl. 35-70.

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Le Blanc, Leo J., Sr. Laser beam folding device. 3,660,778, Cl. 331-94.5

Leblond, Jean, to Uniroyal Englebert France S.A. Bagless tire press. 3,659,975, Cl. 425-36.

Leboutet, Hubert; Jaouen, Jean; and Aucouturier, Jeanne, to Thomson-CSF. Electron beam deflector system. 3,660,658, Cl. 250-49.5

Lecht, Charles P.; Harden, William O.; Lavell, Matthew J.; Kos, Stanley M.; and Pace, Robert A., to Advanced Computer Techniques Corporation. Calculating display board. 3,660,645, Cl. 235-152.000

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Lee, Raymond, Organization, Inc., The: *See—*
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Ley, Kurt; Eholzer, Ulrich; Nast, Roland; and Seng, Florin, to Farbenfabriken Bayer Aktiengesellschaft. Preparation of quinoxaline-di-N-oxides. 3,660,398, Cl. 260-250.

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Mc Cullough, James D., to Du Pont de Nemours, E. I., and Company. Yarn heating jet. 3,659,350, Cl. 34-155.
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Mc Dougall, John D., to Sprague Electric Company. Complementary metal insulator silicon transistor pairs. 3,660,735, Cl. 317-235.
Mc Elroy, Philip W. Concrete pump. 3,659,970, Cl. 417-516.
McFarlane, William, to Emerson Electric Co. Methods of making electric resistance heating mats. 3,659,338, Cl. 29-611.
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McKinstry, Richard G., to Anchor Hocking Corporation. Glass treating tunnel. 3,659,551, Cl. 118-48.
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41R 3,659,566
41.12 3,659,567
41.69 3,659,568
41.79 3,659,569
98 3,659,570
102 3,659,571
119B 3,659,573
119 3,659,572
121 3,659,574
124R 3,659,575

CLASS 124
7 3,659,576
24 3,659,577

CLASS 126
21A 3,659,579
21R 3,659,578
37R 3,659,580
113 3,659,581
198 3,659,582
343.5A 3,659,583
369 3,659,584
390 3,659,585

CLASS 128
2E 3,659,586
2F 3,659,587
2R 3,659,588
2.05C 3,659,592
2.05F 3,659,591
2.08 3,659,589
3,659,590
64 3,659,593
69 3,659,594
92D 3,659,595
130 3,659,596
3,659,597
145.8 3,659,598
157 3,659,599
172 3,659,600
188 3,659,601
212 3,659,604
214B 3,659,603
220 3,659,602
276 3,659,605
303R 3,659,606
305 3,659,607
314 3,659,608
325 3,659,609
347 3,659,610
351 3,659,611
3,659,612
395 3,659,613
410 3,659,614
419P 3,659,615
3,659,616
546 3,659,617

CLASS 130
27R 3,659,618
30R 3,659,619

CLASS 131
146 3,659,620

CLASS 132
53 3,659,621
3,659,622

CLASS 133
255 3,659,623

CLASS 134
22 3,660,160
32 3,660,159

CLASS 136
67 3,660,161
83R 3,660,162
3,660,163
3,660,164
86D 3,660,165
3,660,166
107 3,660,167
3,660,168
111 3,660,169
154 3,660,170

CLASS 137
75 3,659,624
204 3,659,625
329.1 3,659,626
344 3,659,627
501 3,659,628
551 3,659,629
596 3,659,630
596.17 3,659,631
610 3,659,632

CLASS 140
111 3,659,633

CLASS 141
163 3,659,634

CLASS 143
43N 3,659,635

CLASS 144
2Z 3,659,636

CLASS 145
3.31 3,659,637

CLASS 146
76R 3,659,638
130 3,659,639
222 3,659,315

CLASS 148
1.5 3,660,171
6.2 3,660,172
6.35 3,660,173
11.5R 3,660,177
12 3,660,174
18 3,660,182
103 3,660,175
142 3,660,176
175 3,660,180
189 3,660,178
3,660,179

CLASS 149
2 3,660,181
21 3,660,183
46 3,660,182

CLASS 150
35 3,659,640
52 3,659,641

CLASS 156
62.2 3,660,184
72 3,660,185
73 3,660,186
79 3,660,187
94 3,660,188
145 3,660,189
150 3,660,190
152 3,660,191
155 3,660,192
169 3,660,193
191 3,660,194
197 3,660,195
235 3,660,196
280 3,660,197
292 3,660,198
306 3,660,199
3,660,200
309 3,660,201
335 3,660,202
384 3,660,203
443 3,660,204
515 3,660,205
545 3,660,206
555 3,660,207
571 3,660,208
580 3,660,209
583 3,660,210

CLASS 161
2 3,660,211
7 3,660,213
38 3,660,214
41 3,660,212
57 3,660,215
68 3,660,217
87 3,660,218
93 3,660,219
3,660,220
128 3,660,221
156 3,660,222
161 3,660,216
168 3,660,223
252 3,660,224

CLASS 162
17 3,660,225
264 3,660,226

CLASS 164
169 3,659,642
260 3,659,643
326 3,659,644
353 3,659,645
3,659,646

CLASS 165
164 3,659,646

CLASS 166
120 3,659,647
3,659,648
247 3,659,649
275 3,659,650
280 3,659,651
299 3,659,652

CLASS 168
44 3,659,653

CLASS 172
699 3,659,654

CLASS 173
1 3,659,655
23 3,659,656
105 3,659,657

CLASS 174
28 3,660,589
47 3,660,590
70R 3,660,591
114R 3,660,592
152R 3,660,593

CLASS 175
4.6 3,659,658
53 3,659,659
3,659,660
85 3,659,661
107 3,659,662
325 3,659,663

CLASS 176
17 3,660,227
20 3,660,228
3,660,229
36R 3,660,230
56 3,660,231
84 3,660,232
87 3,660,233

CLASS 177
1 3,659,665
25 3,659,664

CLASS 178
5.2A 3,660,595
3,660,597
5.2R 3,660,594
5.2 3,660,596
5.4SD 3,660,598
6 3,660,599
88 3,660,601

CLASS 179
1VC 3,660,603
1A 3,660,602
8A 3,660,604
15AN 3,660,608
15AS 3,660,605
15BA 3,660,606
15BT 3,660,607
16F 3,660,609
18BC 3,660,610
18EA 3,660,600
18ES 3,660,611
18D 3,660,612
98 3,660,613
100.2MD 3,660,616
100.2C 3,660,617
100.2T 3,660,614
3,660,615
115.5R 3,660,618
170.2 3,660,619
175.3 3,660,620

CLASS 180
6.2 3,659,666
3,659,667
6.7 3,659,668
9.5 3,659,669
3,659,670
24.02 3,659,671
65R 3,659,672

CLASS 182
115 3,659,673

CLASS 184
6.16 3,659,674
39 3,659,675

CLASS 185
40R 3,659,676

CLASS 187
61 3,659,677

CLASS 188
5 3,659,678
62 3,659,679
3,659,680
72.5 3,659,685
72.9 3,659,681
134 3,659,682
162 3,659,683
322 3,659,684

CLASS 191
2 3,660,621

CLASS 192
3,659,686
3.33 3,659,690
4B 3,659,687
105CE 3,659,688
112 3,659,689

CLASS 193
2C 3,659,691

CLASS 194
59 3,659,692

CLASS 195
1.2 3,660,234
29 3,660,235
65 3,660,236
66A 3,660,238
66B 3,660,239
66R 3,660,237
103.5R 3,660,240
127 3,660,241
139 3,660,242
3,660,243
143 3,660,244

CLASS 198
20 3,659,693
25 3,659,694
35 3,659,695
127 3,659,696
136 3,659,697
140 3,659,698
165 3,659,699
213 3,659,700
221 3,659,701
3,659,702

CLASS 200
19A 3,660,622
19R 3,660,623
44 3,660,624
148J 3,660,625
168G 3,660,626
175 3,660,627

CLASS 202
99 3,660,245
187 3,660,246

CLASS 203
1 3,660,247
7 3,660,248

CLASS 204
1T 3,660,249
3,660,250
15 3,660,251
17 3,660,252
34 3,660,253
59 3,660,254
3,660,255
67 3,660,256
72 3,660,257
73A 3,660,259
73 3,660,258
98 3,660,261
158R 3,660,260
181 3,660,262
3,660,263
197 3,660,264
212 3,660,265
300 3,660,266

CLASS 206
1A 3,659,703
45.14 3,659,704
45.34 3,659,705
56AB 3,659,706
65B 3,659,707

CLASS 208
8 3,660,267
3,660,269
11 3,660,268
59 3,660,270
65 3,660,271
93 3,660,272
96 3,660,273
120 3,660,274
138 3,660,275
212 3,660,276

CLASS 209
5 3,659,708
82 3,659,709
125 3,659,710
457 3,659,711

CLASS 210
6 3,660,277
11 3,660,278
19 3,660,279
22 3,660,280
23 3,660,281
33 3,660,282
3,660,283
49 3,660,284
65 3,660,285
73 3,659,712
83 3,659,713
107 3,659,714
242 3,659,715
247 3,659,716
329 3,659,717
333 3,659,718
483 3,659,719
525 3,659,720

CLASS 211
7 3,659,721
106 3,659,722
151 3,659,723

CLASS 213
8 3,659,724
75TC 3,659,725

CLASS 214
6H 3,659,727
3,659,728
6P 3,659,726
25 3,659,729
146E 3,659,730
314 3,659,731
621 3,659,732
730 3,659,733
764 3,659,734

CLASS 215
9 3,659,735
40 3,659,736

CLASS 217
12R 3,659,737

CLASS 219
69V 3,660,628
73 3,660,629
76 3,660,630
78 3,660,631
85 3,660,632
222 3,660,634
273 3,660,635
388 3,660,633
3,660,636
413 3,660,637

CLASS 220
42B 3,659,738
53 3,659,739
54 3,659,740
63R 3,659,741
86R 3,659,742
97E 3,659,743

CLASS 221
1 3,659,744
12 3,659,745
185 3,659,746

CLASS 222
14 3,659,747
56 3,659,748
145 3,659,749
153 3,659,750
194 3,659,751
195 3,659,752
199 3,659,753
368 3,659,754
397 3,659,755
531 3,659,756
541 3,659,757
561 3,659,758

CLASS 224
5R 3,659,759
25A 3,659,760
39R 3,659,761
42.03B 3,659,762
42.45R 3,659,763

CLASS 225
2 3,659,764
4 3,659,765
94 3,659,766

CLASS 226
195 3,659,767

CLASS 227
10 3,659,768
68 3,659,769

CLASS 228
1 3,659,770
2 3,659,771

CLASS 229
3.1 3,659,772
33 3,659,773
52B 3,659,774
53 3,659,775
54R 3,659,776
55 3,659,777

CLASS 232
43.1 3,659,778

CLASS 234
114 3,659,779
265.1B 3,659,789

CLASS 235
61.11C 3,660,640
61.11J 3,660,639
61.12N 3,660,641
61.6R 3,660,638
92PL 3,660,644
92C 3,660,642
92J 3,660,643
95R 3,659,780
152 3,660,645
153 3,660,646
155 3,660,837
181 3,660,647
186 3,660,648
193 3,660,649

CLASS 236
11 3,659,781
68B 3,659,782
93 3,659,783

CLASS 238
349 3,659,784

CLASS 239
2R 3,659,785
5 3,659,786
15 3,659,787
127.1 3,659,788
265.19 3,659,789
336 3,659,790
375 3,659,791

CLASS 240
25 3,660,650
73BJ 3,660,651

CLASS 241
21 3,659,792
187 3,659,793
189R 3,659,794

CLASS 242
7.03 3,659,795
18.1 3,659,796
55.19A 3,659,797
71.3 3,659,798
71.9 3,659,799
107SB 3,659,801
107.4 3,659,800
128 3,659,802
130.1 3,659,803
195 3,659,804
201 3,659,805
3,659,806
219 3,659,807
3,659,808

CLASS 243
19 3,659,809

CLASS 244
76R 3,659,810
110C 3,659,811
114R 3,659,812
116 3,659,813

CLASS 246
125 3,660,652
182B 3,660,653

CLASS 248
23 3,659,814
97 3,659,816
242 3,659,815
317 3,659,817
363 3,659,818
373 3,659,819
447 3,659,820

CLASS 249
84 3,659,821

CLASS 250
41.9SB 3,660,655
41.9TF 3,660,654
49.5ZC 3,660,656
49.5D 3,660,657
3,660,658
62 3,660,660
83.3D 3,660,662
83.3H 3,660,659
3,660,661
3,660,663
86 3,660,664
202 3,660,665
206 3,660,666
209 3,660,667
213VT 3,660,668
217S 3,660,669
219DC 3,660,670

CLASS 251
178 3,659,822

CLASS 252
8.55B 3,660,287
8.8 3,660,286
40.7 3,660,288
51.5A 3,660,289
3,660,290
62.51 3,660,291
62.6 3,660,292
79.4 3,660,293
100 3,660,294
104 3,660,295
106 3,660,296
156 3,660,297
188.3 3,660,298
300 3,660,299
301.1R 3,660,300
309 3,660,301
3,660,302
311.5 3,660,303
316 3,660,304
321 3,660,305
415 3,660,306
3,660,307
416 3,660,308
442 3,660,309
454 3,660,310
518 3,660,312
522 3,660,311
545 3,660,313

CLASS 254
93 3,659,823
124 3,659,824

CLASS 259
60 3,659,825
102 3,659,826
110 3,659,827
190 3,659,828

CLASS 260
2A 3,660,314
3,660,315
2N 3,660,316
2.2C 3,660,317
2.5AC 3,660,319
2.5FP 3,660,318
3,660,321
2.5P 3,660,320
5 3,660,323

17R 3,660,325
17.5 3,660,324
18TN 3,660,326
22CQ 3,660,329
22TN 3,660,327
3,660,330
22R 3,660,328
23XA 3,660,331
3,660,332
23H 3,660,333
28.5AV 3,660,334
3,660,335
28.5A 3,660,336
29.2R 3,660,337
29.6NR 3,660,338
29.7D 3,660,339
31.8HA 3,660,340
32.6N 3,660,341
33.6 3,660,348
3,660,349
37EP 3,660,343
37SB 3,660,345
37N 3,660,344
41 3,660,346
42.97 3,660,443
45.75R 3,660,350
45.85 3,660,351
45.95 3,660,352
47EC 3,660,354
47UA 3,660,353
75N 3,660,356
75R 3,660,358
75S 3,660,521
77.5AN 3,660,357
77.5CR 3,660,355
3,660,359
78L 3,660,522
78R 3,660,361
78.5E 3,660,360
79 3,660,362
80.78 3,660,363
3,660,364
82.5 3,660,365
85.3 3,660,366
85.5 3,660,527
92.1 3,660,367
92.3 3,660,368
93.1 3,660,369
93.31 3,660,371
94.9R 3,660,370
141 3,660,372
203 3,660,373
207 3,660,374
207.1 3,660,375
210E 3,660,376
211R 3,660,377
211.5R 3,660,378
239.1 3,660,379
239.3B 3,660,381
239.3T 3,660,380
239.5 3,660,382
239.9 3,660,383
240A 3,660,384
3,660,385
242 3,660,386
243C 3,660,395
3,660,396
244R 3,660,387
246B 3,660,388
247.2B 3,660,389
247.2 3,660,390
247.5R 3,660,391
248NS 3,660,392
249 3,660,393
249.9 3,660,394
250R 3,660,397
3,660,398
3,660,399
3,660,400
3,660,401
251QA 3,660,322
251A 3,660,402
251R 3,660,403
256.4R 3,660,404
256.5R 3,660,405
268TR 3,660,406
273 3,660,407
281 3,660,408
293.76 3,660,410
293.81 3,660,411
294.8E 3,660,412
294.8K 3,660,413
294.9 3,660,414
3,660,415
297R 3,660,416
306.7 3,660,417
3,660,418
309 3,660,419
3,660,420
309.2 3,660,421
3,660,422
309.6 3,660,423
310D 3,660,426
310R 3,660,424
3,660,425
314.5 3,660,427
325 3,660,428
326.16 3,660,430
326.5A 3,660,429
332.3R 3,660,431
343 3,660,433
348SC 3,660,434
348R 3,660,432
397.45 3,660,437
397.5 3,660,435
397.7 3,660,436
404.5 3,660,438
410.9R 3,660,439
3,660,440
413 3,660,441
429.7 3,660,442
439R 3,660,444
3,660,445
3,660,446
448AD 3,660,447
448.2D 3,660,449
448.2N 3,660,448
3,660,452
448.2R 3,660,451
3,660,453
448.8R 3,660,454
453PC 3,660,458
453SP 3,660,456
453R 3,660,455
459 3,660,459
464 3,660,457
3,660,460
465D 3,660,461
3,660,462
465.5R 3,660,463
470 3,660,464
471C 3,660,465
471R 3,660,466
479S 3,660,467
488F 3,660,468
501.11 3,660,469
501.12 3,660,470
513R 3,660,471
513 3,660,472
515A 3,660,473
518R 3,660,474
519 3,660,475
524R 3,660,476
3,660,477
525 3,660,478
530N 3,660,479
533N 3,660,480
533R 3,660,481
541 3,660,483
552R 3,660,484
553A 3,660,486
556A 3,660,487
558H 3,660,485
566R 3,660,511
584 3,660,488
586R 3,660,489
3,660,490
592 3,660,491
593 3,660,492
604HF 3,660,493
606.5B 3,660,494
606.5P 3,660,495
607A 3,660,496
609A 3,660,497
611A 3,660,409
3,660,498
613D 3,660,499
3,660,501
613R 3,660,500
615A 3,660,502
617H 3,660,503
3,660,504
619R 3,660,505
666PY 3,660,508
666A 3,660,342
3,660,507
3,660,509
666 3,660,506
669R 3,660,510
675.5 3,660,512
680E 3,660,513
3,660,514
681.5R 3,660,515
683D 3,660,516
3,660,517
683.15D 3,660,518
3,660,519
683.43 3,660,520
825 3,660,524
830P 3,660,523
836 3,660,525
837R 3,660,526
861 3,660,528
3,660,532
876B 3,660,531
876R 3,660,529
876 3,660,530
878B 3,660,533
880R 3,660,534
3,660,536
880 3,660,535

885 3,660,537
899 3,660,538
920 3,660,539
941 3,660,540
944 3,660,541
946 3,660,542
948 3,660,543

CLASS 263

32 3,659,829

CLASS 264

1 3,660,545
3C 3,660,546
8 3,660,544
22 3,660,549
24 3,660,547
40 3,660,550
47 3,660,548
49 3,660,551
68 3,660,552
71 3,660,553
78 3,660,554
126 3,660,555
185 3,660,556
210F 3,660,557

CLASS 266

3R 3,659,830
4A 3,659,831
30 3,659,832
37 3,659,833

CLASS 267

70 3,659,834
136 3,659,835

CLASS 270

86 3,659,836

CLASS 271

9 3,659,837
11 3,659,838
46 3,659,839
64 3,659,840
88 3,659,841

CLASS 272

57B 3,659,842
57R 3,659,843
58 3,659,844
69 3,659,845
80 3,659,846

CLASS 273

55R 3,659,847
3,659,848
96B 3,659,849
102.2R 3,659,850
130B 3,659,851
134AD 3,659,852
138A 3,659,853
155 3,659,854
173 3,659,855
177R 3,659,856

CLASS 274

4F 3,659,857
3,659,858
3,659,859

CLASS 277

59 3,659,860
96 3,659,861
106 3,659,862

CLASS 279

4 3,659,863
121 3,659,864

CLASS 280

7.1 3,659,865
7.15 3,659,878
11.35T 3,659,866
36C 3,659,867
47.32 3,659,868
96.1 3,659,869
124F 3,659,870
221 3,659,871
289 3,659,872
415A 3,659,873
446 3,659,874
477 3,659,875
511 3,659,876

CLASS 285

3 3,659,877
114 3,659,879
161 3,659,880
249 3,659,881
333 3,659,882
348 3,659,883

CLASS 287

189.36R 3,659,884

CLASS 290

1 3,660,671

CLASS 292

2 3,659,885
78 3,659,886

CLASS 293

1 3,659,887
91 3,660,247

CLASS 294

5.5 3,659,889
19R 3,659,891
49 3,659,888
104 3,659,890

CLASS 296

3 3,659,892
23MC 3,659,894
23R 3,659,893
65R 3,659,895
93 3,659,896

CLASS 297

337 3,659,897
445 3,659,898

CLASS 298

22R 3,659,899

CLASS 299

43 3,659,900

CLASS 301

65 3,659,901

CLASS 303

6C 3,659,902
20 3,659,903
21CF 3,659,907
21CG 3,659,904
21A 3,659,906
21F 3,659,905

CLASS 305

38 3,659,908

CLASS 307

17 3,660,672
88.3 3,660,673
202 3,660,674
208 3,660,675
3,660,676
209 3,660,677
3,660,678
231 3,660,679
234 3,660,680
237 3,660,681
3,660,682
252B 3,660,687
252K 3,660,683
252N 3,660,686
252W 3,660,688
260 3,660,685
269 3,660,689
270 3,660,684
273 3,660,690
293 3,660,691
3,660,692
3,660,693
296 3,660,694
304 3,660,697
309 3,660,695
3,660,696
311 3,660,698

CLASS 308

6R 3,659,909
9 3,659,910
122 3,659,911
217 3,659,912

CLASS 310

9.4 3,660,699
11 3,660,700
3,660,701
61 3,660,702
68E 3,660,703
80 3,660,704
198 3,660,705

CLASS 312

71 3,659,913

CLASS 313

64 3,660,706
80 3,660,707
85S 3,660,708
3,660,709
109.5 3,660,710
220 3,660,711
307 3,660,712
318 3,660,713

CLASS 315

27GD 3,660,717
86 3,660,714
111 3,660,715
187 3,660,716

CLASS 317

11C 3,660,723
13B 3,660,718
16 3,660,719
3,660,720
3,660,721
3,660,724
18R 3,660,722
68 3,660,725
101CM 3,660,726
118 3,660,728
134 3,660,729
148.5R 3,660,731
148.5 3,660,730
157.5 3,660,727

234R 3,660,732
234 3,660,733
235R 3,660,734
3,660,735
3,660,819
262F 3,660,736

CLASS 318

138 3,660,737
3,660,738
227 3,660,739
265 3,660,740
325 3,660,741
345 3,660,742
588 3,660,743
616 3,660,744
676 3,660,745
696 3,660,746
3,660,747

CLASS 320

39 3,660,748

CLASS 321

2 3,660,749
3,660,750
3,660,751

CLASS 322

26 3,660,752

CLASS 323

22T 3,660,753

CLASS 324

5 3,660,754
10 3,660,755
29.5 3,660,759
80 3,660,756
122 3,660,757
158T 3,660,758

CLASS 325

28 3,660,760
42 3,660,761
51 3,660,762
320 3,660,764
363 3,660,763
478 3,660,765

CLASS 328

14 3,660,766
15 3,660,767
26 3,660,768
127 3,660,769
253 3,660,770

CLASS 329

104 3,660,771

CLASS 330

18 3,660,772
30D 3,660,773
3,660,774

CLASS 331

1A 3,660,781
57 3,660,775
94.5 3,660,776
3,660,777
3,660,778
3,660,779
3,660,780

CLASS 332

1 3,660,782

CLASS 333

10 3,660,783
22F 3,660,784
28 3,660,785
29 3,660,786
76 3,660,787
98R 3,660,788

CLASS 334

94.5 3,660,779

CLASS 335

206 3,660,789

CLASS 336

69 3,660,790
192 3,660,791

CLASS 337

102 3,660,792
348 3,660,793
401 3,660,794

CLASS 338

32 3,660,795
180 3,660,796

CLASS 339

22B 3,660,820
29R 3,660,797
36 3,660,798
61M 3,660,799
94L 3,660,800
97L 3,660,801
126RS 3,660,802
176MP 3,660,803
177 3,660,804
183 3,660,805
256SP 3,660,806

CLASS 340

3T 3,660,807
5R 3,660,808

8S 3,660,809
33 3,660,811
35 3,660,812
52A 3,660,815
52F 3,660,814
52R 3,660,813
58 3,660,816
114 3,660,817
146.2 3,660,823
172.5 3,660,824
3,660,825
173FF 3,660,827
173LS 3,660,818
173NR 3,660,822
173R 3,660,826
174TB 3,660,829
174TF 3,660,828
174.1H 3,660,821
204 3,660,830
259 3,660,810
274 3,660,831
280 3,660,832
324A 3,660,833
325 3,660,835
347NT 3,660,834
347R 3,660,836
365 3,660,838
381 3,660,839
421 3,660,840

CLASS 343

5DP 3,660,841
7ED 3,660,846
16R 3,660,842
17.1R 3,660,845
18C 3,660,843
18E 3,660,844
112PT 3,660,847
749 3,660,848

CLASS 350

3.5 3,659,914
96WG 3,659,915
3,659,916
160 3,659,917
166 3,659,918
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174 3,659,920
186 3,659,921
202 3,659,922
215 3,659,923
224 3,659,924
225 3,659,925
285 3,659,926
286 3,659,927
291 3,659,928
307 3,659,929

CLASS 351

36 3,659,930
41 3,659,931

CLASS 352

242 3,659,932

CLASS 353

44 3,659,933
103 3,659,934

CLASS 355

1 3,659,935
3 3,659,936
3,659,937
3,659,938

CLASS 356

2 3,659,939
36 3,659,940
51 3,659,941
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70 3,659,943
86 3,659,944
100 3,659,945
104 3,659,946
106 3,659,947
110 3,659,948
156 3,659,949
199 3,659,950

CLASS 401

190 3,659,951
196 3,659,952
198 3,659,953
223 3,659,954

CLASS 408

1 3,659,482

CLASS 415

116 3,659,955
219 3,659,956

CLASS 416

179 3,659,957
199 3,659,958
212 3,659,959

CLASS 417

53 3,659,960
114 3,659,961
179 3,659,962
213 3,659,963
360 3,659,964
363 3,659,965

395	3,659,966	78	3,660,562	232	3,660,573		3,659,974	88	3,659,986	247	3,659,997
397	3,659,967	81	3,660,563	238	3,660,574	36	3,659,975	89	3,659,981	326	3,659,998
417	3,659,968	85	3,660,564	271	3,660,575	42	3,659,976	97	3,659,987		3,659,999
440	3,659,969	89	3,660,565	273	3,660,576	62	3,659,977	131	3,659,988	327	3,660,000
516	3,659,970	95	3,660,566		3,660,577		3,659,979		3,659,989	396	3,660,001
538	3,659,971	122	3,660,567	274	3,660,578	63	3,659,978	141	3,659,990	405	3,660,002
CLASS 420			3,660,568	308	3,660,579		3,659,982	174	3,659,991	427	3,660,003
232	3,660,573	124	3,660,569	327	3,660,580	72	3,659,980	192	3,659,992	452	3,660,004
CLASS 424		147	3,660,570	343	3,660,560		3,659,983	214	3,659,993	CLASS 431	
7	3,660,558	181	3,660,571	CLASS 425			3,659,984	242	3,659,994	66	3,660,005
9	3,660,559	200	3,660,572	1	3,659,972				3,659,995	168	3,660,006
47	3,660,561			29	3,659,973	78	3,659,985	245	3,659,996	351	3,660,007

CLASSIFICATION OF DESIGNS

D 2—	310 223,531		223,536		15 223,541	D45—	10 223,545	D61—	1 223,549	D85—	2 223,553
D 8—	274 223,532	D26—	8 223,537		223,542	D48—	20 223,546		223,550	D90—	14 223,554
D 9—	179 223,533	D33—	14 223,538		223,543		223,547	D71—	223,551		17 223,555
D14—	30 223,534	D34—	3 223,539	D44—	6 223,544	D52—	10 223,548	D74—	223,552	D97—	2 223,556
D15—	1 223,535		5 223,540								

CLASSIFICATION OF PLANTS

P. —	28 3,144	P. —	57 3,143	P. —	69 3,146	P. —	3,148	P. —	3,151	P. —	3,152
P. —	41 3,145	P. —	68 3,149	P. —	3,147	P. —	88 3,150				

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Canal Zone	7	Minnesota	27	Tennessee	47
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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 3,659,873	3,659,755	3,660,343	3,659,735	3,660,040	3,659,774
3,660,434	3,659,761	3,660,429	3,659,758	3,660,105	3,659,783
3,660,570	3,659,770	3,660,441	3,659,768	3,660,170	3,659,795
2 : 3,659,502	3,659,772	3,660,465	3,659,802	3,660,195	3,659,797
4 : 3,659,374	3,659,781	3,660,494	3,659,840	3,660,234	3,659,852
3,659,448	3,659,782	3,660,541	3,659,879	3,660,258	3,659,857
3,659,652	3,659,809	3,660,580	3,659,945	3,660,259	3,659,858
3,659,653	3,659,816	3,660,608	3,659,950	3,660,285	3,659,859
3,659,725	3,659,824	3,660,614	3,659,999	3,660,361	3,659,891
3,659,874	3,659,831	3,660,617	3,660,114	3,660,512	3,659,897
3,659,890	3,659,835	3,660,631	3,660,131	3,660,588	3,659,898
3,660,209	3,659,843	3,660,659	3,660,140	3,660,778	3,659,927
3,660,585	3,659,856	3,660,666	3,660,177	3,660,816	3,659,934
3,660,669	3,659,863	3,660,672	3,660,203	3,660,843	3,659,953
3,660,773	3,659,868	3,660,673	3,660,277	13 : 3,659,387	3,659,971
3,660,799	3,659,885	3,660,684	3,660,316	3,659,992	3,660,007
5 : 3,659,391	3,659,892	3,660,685	3,660,351	3,660,134	3,660,056
6 : 3,659,300	3,659,914	3,660,690	3,660,458	3,660,590	3,660,064
3,659,304	3,659,926	3,660,712	3,660,478	3,660,811	3,660,073
3,659,322	3,659,932	3,660,713	3,660,622	14 : 3,659,888	3,660,110
3,659,368	3,659,942	3,660,715	3,660,664	15 : 3,660,072	3,660,118
3,659,377	3,659,943	3,660,723	3,660,757	3,660,671	3,660,127
3,659,422	3,659,957	3,660,724	10 : 3,659,350	17 : 3,659,317	3,660,191
3,659,445	3,659,967	3,660,732	3,659,949	3,659,319	3,660,193
3,659,462	3,659,970	3,660,746	3,660,008	3,659,326	3,660,271
3,659,467	3,659,983	3,660,758	3,660,017	3,659,351	3,660,289
3,659,475	3,659,994	3,660,787	3,660,050	3,659,369	3,660,290
3,659,484	3,660,005	3,660,803	3,660,192	3,659,384	3,660,300
3,659,485	3,660,069	3,660,819	3,660,222	3,659,426	3,660,301
3,659,488	3,660,087	3,660,821	3,660,247	3,659,426	3,660,305
3,659,493	3,660,107	3,660,827	3,660,281	3,659,427	3,660,308
3,659,498	3,660,113	3,660,829	3,660,314	3,659,432	3,660,309
3,659,510	3,660,116	3,660,841	3,660,368	3,659,455	3,660,334
3,659,514	3,660,126	3,660,842	3,660,808	3,659,492	3,660,339
3,659,529	3,660,154	3,660,846	11 : 3,660,703	3,659,573	3,660,342
3,659,532	3,660,155	8 : 3,659,416	3,660,704	3,659,582	3,660,390
3,659,535	3,660,162	3,659,458	12 : 3,659,333	3,659,584	3,660,405
3,659,557	3,660,164	3,659,671	3,659,388	3,659,590	3,660,473
3,659,558	3,660,211	3,659,754	3,659,461	3,659,592	3,660,485
3,659,576	3,660,223	3,659,818	3,659,506	3,659,603	3,660,496
3,659,612	3,660,230	3,660,047	3,659,507	3,659,614	3,660,503
3,659,654	3,660,231	3,660,268	3,659,549	3,659,638	3,660,547
3,659,666	3,660,233	9 : 3,659,306	3,659,712	3,659,668	3,660,609
3,659,676	3,660,243	3,659,313	3,659,714	3,659,672	3,660,610
3,659,680	3,660,249	3,659,400	3,659,778	3,659,700	3,660,618
3,659,684	3,660,270	3,659,452	3,659,791	3,659,723	3,660,623
3,659,695	3,660,275	3,659,483	3,659,807	3,659,734	3,660,627
3,659,699	3,660,288	3,659,593	3,659,808	3,659,744	3,660,651
3,659,703	3,660,293	3,659,598	3,659,849	3,659,756	3,660,653
3,659,709	3,660,310	3,659,637	3,659,986	3,659,767	3,660,660
3,659,746	3,660,336	3,659,686	3,660,029	3,659,771	3,660,668

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18 : 223,553

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27 : 223,533

34 : 223,548
223,550

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6 : 3,144
6 : 3,145

34 : 3,150

3,151

3,152

48 : 3,149

55 : 3,143

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